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WQREH  
(TM)  
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MPSrch\_pp prote: - protein database search, using Smith-Waterman algorithm

On: Tue Aug 29 15:39:31 2000; MasPar time 13.05 seconds  
Tabular output no generated. 799.062 Million cell updates/sec

Title: >US-09-121-017B-1  
Description: (1-221) from US09121017B.pep  
Perfect Score: 1593  
Sequence: 1 NARLRFALLFFVGVIES.....PRHYGOKAILFLPLVSD 221

Scoring table: PAM 150  
Gap 11

Searched: 142080 seqs, 4717246 residues

Post-processing: Minimum Match 0%  
Listing first 45 summaries

Database: p1r64  
1: p1r1 2: p1r2 3: p1r3 4: p1r4

Statistics: Mean 45.223; Variance 83.789; scale 0.540

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description	Pred. No.
1	984	61.8	155	1	A33665	acidic fibroblast gro
2	972	61.0	155	2	D37360	acidic fibroblast gro
3	972	61.0	155	3	S04147	acidic fibroblast gro
4	967	60.7	155	1	A60721	acidic fibroblast gro
5	95	59.8	152	2	JH0476	acidic fibroblast gro
6	92	57.9	155	1	GKBOA	acidic fibroblast gro
7	92	57.9	155	2	A60130	acidic fibroblast gro
8	91	57.3	151	2	JW0055	fibroblast growth fac
9	61	38.2	19	2	JC1457	ryudocan precursor -
10	5	32.8	1F	2	A48834	basic fibroblast grow
11	5	32.4	1	1	S00185	basic fibroblast grow
12	5	32.4	1	1	GKBOH	basic fibroblast grow
13	5	32.0	1	0	A32398	basic fibroblast grow
14	5	31.9	134	2	A31674	basic fibroblast grow
15	5	31.9	154	2	C37360	basic fibroblast grow
16	4	31.3	164	2	S31622	basic fibroblast grow
17	4	30.7	155	1	A40117	basic fibroblast grow
18	4	29.3	137	2	I46711	fibroblast growth fac
19	394	24.7	202	2	A42410	ryudocan precursor -
20	360	22.6	208	2	A48137	fibroblast growth fac
21	360	22.6	208	2	S66486	fibroblast growth fac
22	359	22.5	198	2	JC5613	ryudocan precursor -
23	329	20.7	207	2	JC5941	fibroblast growth fac

```

#authors      Chiu, I.M.; Wang, W.P.; Lehtoma, K.
#journal      Oncogene (1990) 5:755-762
#title        Alternative splicing generates two forms of mRNA coding for
#             human heparin-binding growth factor 1.
#cross-references MUID:90265618
#accession    A43804
##molecule_type mRNA
##residues    1-155 ##label CHI
##cross-references EMBL:X51943; NID:g32435; PIDN:CAA36206.1; PID:g32436
REFERENCE
A24662
#authors      Jaye, M.; Hawk, R.; Burgess, W.; Ricca, G.A.; Chiu, I.M.;
              Raveria, M.W.; O'Brien, S.J.; Modi, W.S.; Maciag, T.;
              Drohan, W.N.
#journal      Science (1986) 233:541-545
#title        Human endothelial cell growth factor: cloning, nucleotide
              sequence, and chromosome localization.
#cross-references MUID:86261805
#accession    A24662
##molecule_type mRNA
##residues    1-155 ##label JAY
##cross-references GB:M13361; NID:g181941; PIDN:AAA79245.1; PID:g181942
REFERENCE
JH0707
#authors      Yu, Y.L.; Kha, H.; Golden, J.A.; Migchielssen, A.A.J.; Goetzl,
              E.J.; Turck, C.W.
#journal      J. Exp. Med. (1992) 175:1073-1080
#title        An acidic fibroblast growth factor protein generated by
              alternate splicing acts like an antagonist.
#cross-references MUID:92202857
#accession    JH0707
##molecule_type mRNA
##residues    1-155 ##label YUI
##cross-references GB:X65778; NID:g396163; PIDN:CAA46661.1; PID:g396164
REFERENCE
S35535
#authors      Payson, R.A.; Canatan, H.; Chotani, M.A.; Wang, W.P.; Harris,
              S.E.; Myers, R.L.; Chiu, I.M.
#journal      Nucleic Acids Res. (1993) 21:489-495
#title        Cloning of two novel forms of human acidic fibroblast growth
              factor (aFGF) mRNA.
#cross-references MUID:93181239
#accession    S35535
##status      translation not shown
##molecule_type mRNA
##residues    1-58 ##label PAY
##cross-references GB:L01485
#accession    S35536
##status      translation not shown
##molecule_type mRNA
##residues    1-58 ##label P2
##cross-references GB:L01487
REFERENCE
I39412
#authors      Crumley, G.; Dionne, C.A.; Jaye, M.
#journal      Biochem. Biophys. Res. Commun. (1990) 171:7-13
#title        The gene for human acidic fibroblast growth factor encodes
              two upstream exons alternatively spliced to the first
              coding exon.
#cross-references MUID:90365758
#accession    I39413
##status      translation not shown
##molecule_type mRNA
##residues    1-40 ##label REI
##cross-references GB:M60515; NID:g178226; PIDN:AAA51672.1; PID:g553170;
              GB:M60516; NID:g178232; PID:g553171
REFERENCE
A23553
#authors      Harper, J.W.; Strydom, E.J.; Lobb, R.R.
#journal      Biochemistry (1986) 25:4997-4103
#cross-references MUID:86296647
#accession    A23553
##molecule_type protein
##residues    16-155 ##label HAR
REFERENCE
A24820
#authors      Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal      Biochem. Biophys. Res. Commun. (1986) 138:611-617
#title        The complete amino acid sequence of human brain-derived
              acidic fibroblast growth factor.
#cross-references MUID:86295741
#accession    A24820
##molecule_type protein
##residues    16-155 ##label GIM
REFERENCE
A90122
#authors      Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal      Biochem. Biophys. Res. Commun. (1986) 135:541-548
#title        Human brain-derived acidic and basic fibroblast growth
              factors: amino terminal sequences and specific mitogenic
              activities.
#cross-references MUID:86186784
#accession    A24243
##molecule_type protein
##residues    16-47 ##label GI2
##experimental_source brain
REFERENCE
A91364
#authors      Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
#journal      FEBS Lett. (1986) 204:203-207
#title        Partial molecular characterization of endothelial cell
              mitogens from human brain: acidic and basic fibroblast
              growth factors.
#cross-references MUID:86275260
#accession    A24301
##molecule_type protein
##residues    16-30, 'X', 32-49 ##label GAU
REFERENCE
A26386
#authors      Gautschi-Sova, P.; Muller, T.; Bohlen, P.
#journal      Biochem. Biophys. Res. Commun. (1986) 140:874-880
#title        Amino acid sequence of human acidic fibroblast growth factor.
#cross-references MUID:87048871
#accession    A26386
##molecule_type protein
##residues    16-155 ##label GA2
##experimental_source brain
REFERENCE
A53639
#authors      Chavan, A.J.; Haley, B.E.; Volkin, D.B.; Marfia, K.E.;
              Verticelli, A.M.; Bruner, M.W.; Draper, J.P.; Burke, C.J.;
              Midaugh, C.R.
#journal      Biochemistry (1994) 33:7193-7202
#title        Interaction of nucleotides with acidic fibroblast growth
              factor (FGF-1).
#cross-references MUID:94271773
#accession    A53639
##molecule_type protein
##residues    16-30, 'X', 32-38; 73-75, 'X', 77-97, 'X', 99-101; 128-131, 'X',
              133-140, 'X', 142-152 ##label CHA
GENETICS
#gene         GDB:FGF1; FGFA
##cross-references GDB:119909; OMIM:131220
#map_position 5q31.3-5q33.2
#introns      57/1; 91/3
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS       alternative splicing; growth factor; heparin binding
FEATURE
16-155        #product fibroblast growth factor 1 #status experimental
              #label HAR\
129           #binding_site carbohydrate (Asn; covalent) #status
              absent
SUMMARY        #length 155 #molecular-weight 17460 #checksum 9243
Query Match    61.8%; Score 984; DB 1; Length 155;
Best Local Similarity 99.3%; Pred. No. 2.18e-185;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;
Db 21 GNYKPKLLYCSNGGHFLRLPDGTVDRSDQHQIQLQLSAESVGEYIKSTFGQYL 80
:|||||
QY 87 ANYKPKLLYCSNGGHFLRLPDGTVDRSDQHQIQLQLSAESVGEYIKSTFGQYL 146.
Db 81 AMDTGLLYGSQTPNECLFLERLENNHYNTYISKHAEKNFVGLKNGSKCKRGPRTHY 140
:|||||
QY 147 AMDTGLLYGSQTPNECLFLERLENNHYNTYISKHAEKNFVGLKNGSKCKRGPRTHY 206

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LINE	ORGANISM	#formal_name	Sus scrofa domestica	#common_name	domestic pig	accrue librobriast growth factor -	pig (irragment)
DATE		31-Mar-1992	#sequence	revision 31-Mar-1992	#text	change	

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16-Jul-1999
JH0476; S20072
ACCESSIONS
REFERENCE
#authors
#journal
#title
#cross-references MUID:92062117
#accession JH0476
#molecule_type mRNA
#residues 1-152 #label SCH
#cross-references EMBL:X60317; NID:g1873; PIDN:CAA42869.1; PID:g1874
#experimental_source heart
#note
internal symmetry axis
COMMENT This protein belongs to the fibroblast growth factor family.
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
FEATURE
22-28
133
#length 152 #checksum 1124
#region nuclear location signal\
#binding_site heparin (Lys) #status predicted
#length 152 #score 953; DB 2; Length 152;
Best Local Similarity 97.0%; Pred. No. 1.91e-178;
Matches 128; Conservative 2; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPLLYCSNGGHFLRIIPDGTDRSDQHTQLQLSAESVGEVIKSTETGQYL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 87 GNYKKPLLYCSNGGHFLRIIPDGTDRSDQHTQLQLSAESVGEVIKSTETGQYL 146
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Db 81 AMDTSGLLYSQTPSEECFLERLEENHNTYTKKHAENKWFVGLKNGSKKGRPTHY 140
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 147 AMDTSGLLYSQTPSEECFLERLEENHNTYTKKHAENKWFVGLKNGSKKGRPTHY 206
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Db 141 GQKAILFLPLPV 152
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 207 GQKAILFLPLPV 218
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 6
ENTRY #type complete
TITLE acidic fibroblast growth factor precursor - bovine
ALTERNATE_NAMES aFGF; eye-derived growth factor II; heparin-binding growth
factor I; prostatiopin
ORGANISM #formal name Bos primigenius taurus #common_name cattle
DATE 13-Aug-1986 #sequence_revision 03-Feb-1994 #text_change
18-Jun-1999
JH0613; S02102; S02065; B24663; A94281; S03953;
A91010; A24477; B25043; C25043; A24539; A60884;
A37892; B37892; A61198; I46024; A34477; A01385
REFERENCE
#authors Renaud, F.; Desset, S.; Bugra, K.; Halley, C.; Philippe,
J.M.; Courtois, Y.; Laurent, M.
#journal Biochem. Biophys. Res. Commun. (1992) 184:945-952
#title Heterogeneity of 3' untranslated region of bovine acidic FGF
transcripts
#cross-references MUID:92246990
#accession JH0613
#molecule_type DNA
#residues 58-155 #label REN
REFERENCE
#authors Halley, C.; Courtois, Y.; Laurent, M.
#journal Nucleic Acids Res (1988) 16:10913
#title Nucleotide sequence of bovine acidic fibroblast growth factor
cDNA.
#cross-references MUID:89083506
#accession S02102
#molecule_type mRNA
#residues 1-155 #label HAL
#cross-references EMBL:X13221; NID:g347; PIDN:CAA31610.1; PID:g348
S02661
REFERENCE
#authors Alterio, J.; Halley, C.; Brou, C.; Soussi, T.; Courtois, Y.;

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Laurent, M.
#journal FEBS Lett. (1988) 242:41-46
#title Characterization of a bovine acidic FGF cDNA clone and its
expression in brain and retina.
#cross-references MUID:89078619
#accession S03661
#molecule_type mRNA
#residues 1-155 #label ALT
#cross-references EMBL:X14032; NID:g322; PIDN:CAA32192.1; PID:g323
S22065
REFERENCE
#authors Philippe, J.M.
#submission submitted to the EMBL Data Library, May 1992
#accession S22065
#molecule_type mRNA
#residues 1-18 #label PHI
#cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
A94290
REFERENCE
#authors Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman,
J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal Science (1986) 233:545-548
#title Nucleotide sequence of a bovine clone encoding the angiogenic
protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession B24663
#molecule_type mRNA
#residues 62-102 #label ABR
A94281
REFERENCE
#authors Gimenez-Gallego, G.; Rodkey, J.; Bennett, C.; Rios-Candelore,
M.; Disalvo, J.; Thomas, K.
#journal Science (1985) 230:1385-1388
#title Brain-derived acidic fibroblast growth factor: complete amino
acid sequence and homologies.
#cross-references MUID:86070224
#accession A94281
#molecule_type protein
#residues 16-155 #label GIM
S03953
REFERENCE
#authors Quinkler, W.; Maasberg, M.; Bernotat-Danielowski, S.; Luethe,
N.; Sharma, H.S.; Schaper, W.
#journal Eur. J. Biochem. (1989) 181:67-73
#title Isolation of heparin-binding growth factors from bovine,
porcine and canine hearts.
#cross-references MUID:89231704
#accession S03953
#molecule_type protein
#residues 16-45 #label QUI
A91010
REFERENCE
#authors Bohlen, P.; Esch, F.; Baird, A.; Gospodarowicz, D.
#journal EMBO J. (1985) 4:1951-1956
#title Acidic fibroblast growth factor (FGF) from bovine brain:
amino-terminal sequence and comparison with basic FGF.
#cross-references MUID:86055750
#accession A91010
#molecule_type protein
#residues 16-30, 'X', 32-34, 'X', 36-44 #label BOH
A24477
REFERENCE
#authors Crabb, J.W.; Ames, L.G.; Carr, S.A.; Johnson, C.M.; Roberts,
G.D.; Bordoli, R.S.; McKeenan, W.L.
#journal Biochemistry (1986) 25:4988-4993
#title Complete primary structure of prostatiopin, a prostate
epithelial cell growth factor.
#cross-references MUID:87026586
#accession A24477
#molecule_type protein
#residues 2, 'GE', 5-155 #label CRA
A94127
REFERENCE
#authors Burgess, W.H.; Mehlman, T.; Marshak, D.R.; Fraser, B.A.;
Maciag, T.
#journal Proc. Natl. Acad. Sci. U.S.A. (1986) 83:7216-7220
#title Structural evidence that endothelial cell growth factor beta
is the precursor of both endothelial cell growth factor
alpha and acidic fibroblast growth factor.
#cross-references MUID:87016918

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Sasaki, H.; Saito, M.; Youki, H.; Karube, K.; Konno, S.;
Onoe, M.; Saito, T.; Aoyagi, S.
J. Biol. Chem. (1989) 264:17606-17612
Purification of acidic fibroblast growth factor from bovine heart and its localization in the cardiac myocytes.
#cross-references MUID:'0008933
#accession A34477
#status preliminary
#molecule_type protein
#residues 16-2A 121-127;134-143 #label SAS
#experimental_source heart
COMMENT The acidic and basic fibroblast growth factors are the major endothelial-cell growth factors. Both are angiogenic agents in vivo and are potent mitogens for a variety of mesoderm-derived cell types in vitro (although bFGF is 30-100 times more potent than aFGF in stimulating the proliferation of normal diploid cells). There are differences in the tissue distribution and concentration of these two growth factors.
This protein binds heparin, although less strongly than does bFGF.
There are some sequence similarities between residues 117-126 (a region flanked by Lys-Lys dipeptides) and a number of neuro peptides, including a gastrin-releasing peptide from the pig
... Note: remainder of annotations omitted.
Query Match 57.9%; Score 923; DB 1; Length 155;
Best Local Similarity 90.4%; Pred. No. 9.72e-172;
Matches 126; Conservative 7; Mismatches 5; Indels 1; Gaps 1;
Ddb 18 LPL-GNYKKPLLKCSN::YFLRLPDGTVDGTRDKRSQDHQLQCAESIGEVYIKSTET 76
||| :||||| :||||| :||||| :||||| :||||| :||||| :||||| :|||||
83 VPLDANIYKKPLLKCSHGHEFLRLLPDGTVDGTRDRSDQHILQLLS'ESVGEVIKSTET 142
Ddb 77 GQFLAMDYDGLLYGSG::PNEECLEFLRELNHNHTYSKKHAKHW-/GLKKNGRSLGP 136
||| :||||| :||||| :||||| :||||| :||||| :||||| :||||| :|||||
143 GOYLAMDYDGLLYGSG::PNEECLEFLRELNHNHTYSKKHAKNM-VGLKKNGRCKRGP 202
Ddb 137 RTHFGOKAILPLPV3SD 155
||| :||||| :||||| :||||| :||||| :||||| :||||| :||||| :|||||
Qy 203 RTHYGOKAILPLPVSSD 221
RESULT 7
ENTRY TITLE A60130 #type complete
ALTERNATE_NAMES acidc fibroblast growth factor - chicken
ORGANISM endothelial cell growth factor
DATE #formal_name Gallus gallus #common_name Chicken
03-Mar-1993 #sequence_revision 03-Mar-1993 #text_change 16-Jun-1999
ACCESSIONS A60130; S02639
REFERENCE A60130
#authors Schuerch, H.; Risau, W.
#journal Development (1991) 111:1143-1154
#title Differentiating and mature neurons express the acidic fibroblast growth factor gene during chick neural development.
#cross-references MUID:91347925
#accession A60130
#status preliminary
#molecule_type mRNA
#residues 1-155 #label SCH
#cross-references GB:S63263; NID:g234372; PIDN:AAB19629.1; PID:g234373
REFERENCE S02639
#authors Risau, W.; Gautschi-Sova, P.; Boehlen, P.
#journal EMBO J. (1988) 7:959-962
#title Endothelial cell growth factors in embryonic and adult chick brain are related to human acidic fibroblast growth factor.
#cross-references MUID:88296438
#accession S02639
#molecule_type protein
#residues 22-30,'X','32-44','X',46-48 #label RIS
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor

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SUMMARY          #length 155 #molecular-weight 17322 #checksum 7617
Query Match      57.9%; Score 922; DB 2; Length 155;
Best Local Similarity 89.2%; Pred. No. 1.63e-171;
Matches 124; Conservative 7; Mismatches 7; Indels 1; Gaps 1;

Db 18 LPL-GNYKKPKLLYCSNGGHFLRILPDGKVDGTRDSQHIQQLQLSAEDVGEVIKSTAS 76
QY 83 VPLDANYKKPKLLYCSNGGHFLRILPDGTVGTRDSQHIQQLQLSAESVGEVIKSTET 142

Db 77 GOFLAMDTNGLLYGSQTSEECFLERLEENHYNTYISKHAKNWFYGLKKNKNGSKLGP 136
QY 143 GOFLAMDTNGLLYGSQTSEECFLERLEENHYNTYISKHAKNWFYGLKKNKNGSKRGP 202

Db 137 RTHYGOKAILFLPLPVSSD 155
QY 203 RTHYGOKAILFLPLPVSSD 221

RESULT 8
ENTRY   JW0055 #type complete
TITLE   fibroblast growth factor-1 - sheep
ALTERNATE_NAMES FGF-1
ORGANISM #formal_name Ovis sp. #common_name sheep
DATE     17-Jun-1998 #sequence_revision 10-Jul-1998 #text_change
07-May-1999
ACCESSIONS JW0055
REFERENCE   JW0055
#authors   Grieb, T.W.; Ring, M.; Brown, E.; Palmer, C.; Belle, N.;
            Donjerakovic, D.; Chang, H.; Yun, J.; Subramanian, R.;
            Forozan, F.; Guo, Y.; Vertes, A.; Winkles, J.A.; Burgess,
            W.H.
#journal   Biochem. Biophys. Res. Commun. (1998) 246:182-191
#title     Primary structure of ovine fibroblast growth factor-1 deduced
            by protein and cDNA analysis.
#cross-references MUID:98262939
#accession JW0055
#molecule_type mRNA
#residues 1-155 #label GRI
COMMENT   This protein is a potent mitogenic factor for NIH 3T3 fibroblasts
            in the absence of heparin.
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY      #length 155 #molecular-weight 17557 #checksum 8890

Query Match      57.3%; Score 912; DB 2; Length 155;
Best Local Similarity 89.2%; Pred. No. 2.78e-169;
Matches 124; Conservative 9; Mismatches 5; Indels 1; Gaps 1;

Db 18 LPL-GNYKKPKLLYCSNGGHFLRILPDGKVDGTRDSQHIQQLQLSAEDVGEVIKSTET 76
QY 83 VPLDANYKKPKLLYCSNGGHFLRILPDGTVGTRDSQHIQQLQLSAESVGEVIKSTET 142

Db 77 GOFLAMDTNGLLYGSQTSEECFLERLEENHYNTYISKHAKNWFYGLKKNKNGSKLGP 136
QY 143 GOFLAMDTNGLLYGSQTSEECFLERLEENHYNTYISKHAKNWFYGLKKNKNGSKRGP 202

Db 137 RTHYGOKAILFLPLPVSSD 155
QY 203 RTHYGOKAILFLPLPVSSD 221

RESULT 9
ENTRY   JC1457 #type complete
TITLE   ryudocan precursor - human
ALTERNATE_NAMES amphiglycan; core protein
ORGANISM #formal_name Homo sapiens #common_name man
DATE     30-Sep-1993 #sequence_revision 30-Sep-1993 #text_change
17-Mar-1999
ACCESSIONS JC1457; S26695
REFERENCE   JC1457
#authors   Kojima, T.; Inazawa, J.; Takamatsu, J.; Rosenberg, R.D.;
            Satio, H.
#journal   Biochem. Biophys. Res. Commun. (1993) 190:814-822

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#title           Human ryudocan core protein: Molecular cloning and
                  characterization of the cDNA, and chromosomal localization
                  of the gene.
#cross-references MUID:93176185
#accession       JC1457
#molecule_type mRNA
#residues        1-198 #label KOJ
#cross-references DDBJ:D13292; NID:g286020; PID:d1003053; PID:g286021
REFERENCE        S26695
#authors         David, G.; van der Schueren, B.; Marynen, P.; Cassiman, J.J.;
                  van den Berghe, H.
#journal         J. Cell Biol. (1992) 118:961-969
#title           Molecular cloning of amphiglycan, a novel integral membrane
                  heparan sulfate proteoglycan expressed by epithelial and
                  fibroblastic cells.
#cross-references MUID:92363936
#accession       S26695
#status          preliminary
#molecule_type mRNA
#residues        1-11, 'L', 13-198 #label DAV
#cross-references EMBL:X67016; NID:g28679; PID:g28680
GENETICS
#map_position    20q12
KEYWORDS         chondroitin sulfate proteoglycan; core protein; glycoprotein;
                  heparan sulfate; transmembrane protein
FEATURE
1-18             #domain signal sequence #status predicted #label SIG\
19-198           #product ryudocan #status predicted #label MAT\
146-170          #domain transmembrane #status predicted #label TMM\
39,61,63         #binding_site heparan sulfate (ser) (covalent) #status
                  predicted
SUMMARY          #length 198 #molecular-weight 21641 #checksum 4522

Query Match      38.2%; Score 508; DB 2; Length 198;
Best Local Similarity 97.7%; Pred. No. 3.90e-102;
Matches 86; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Db 1 MAPARFALLFFVGGVAESTRETEVIDPDLLGRTFGALPDDEVDVGGQESDDFEL 60
QY 1 MAPARFALLFFVGGVAESTRETEVIDPDLLGRTFGALPDDEVDVGGQESDDFEL 60

Db 61 SGGSDLDLEDSDMIGPEVHVPLVPLDNH 88
QY 61 SGGSDLDLEDSDMIGPEVHVPLVPLDNH 88

RESULT 10
ENTRY   A48834 #type complete
TITLE   basic fibroblast growth factor - chicken
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE     01-Dec-1993 #sequence_revision 18-Nov-1994 #text_change
16-Jul-1999
ACCESSIONS A48834; S23636
REFERENCE   A48834
#authors   Borja, A.Z.; Meijers, C.; Zeller, R.
#journal   Dev. Biol. (1993) 157:110-118
#title     Expression of alternatively spliced bFGF first coding exons
            and antisense mRNAs during chicken embryogenesis.
#cross-references MUID:93245053
#accession   A48834
#status      preliminary
#molecule_type nucleic acid
#residues    1-189 #label BOR
#experimental_source embryo
#note        Sequence extracted from NCBI backbone (NCBIN:131000,
            NCBIPI:131001)
REFERENCE    S23636
#authors     Mitrani, E.; Gruenbaum, Y.; Shohat, H.; Ziv, T.
#journal     Development (1990) 109:387-393
#title       Fibroblast growth factor during mesoderm induction in the
            early chick embryo.
#cross-references MUID:90382254
#accession   S23636

```



```

#title      Isolation of an amino terminal extended form of basic
#cross-references MUID:86295737
#contents   annotation
#note       the amino end of this form was blocked; the peptide
            composition matched what was thought to be the signal
            sequence
REFERENCE
#authors    Gospodarowicz, D.; Baird, A.; Cheng, J.; Lui, G.M.; Esch, F.;
            Bohlen, P.
#journal     Endocrinology (1986) 118:82-90
#title      Isolation of fibroblast growth factor from bovine adrenal
            gland: physicochemical and biological characterization.
#cross-references MUID:86081530
#accession  A61094
#molecule_type protein
#residues   12-25;27-35,'X',37-40 #label GOS
#experimental_source adrenal gland
REFERENCE
#authors    Esch, F.; Baird, A.; Ling, N.; Ueno, N.; Hill, F.; Denoroy,
            L.; Klepper, R.; Gospodarowicz, D.; Bohlen, P.; Guillemin,
            R.
#journal     Proc. Natl. Acad. Sci. U.S.A. (1985) 82:6507-6511
#title      Primary structure of bovine pituitary basic fibroblast growth
            factor (bFGF) and comparison with the amino-terminal
            sequence of bovine brain acidic bFGF.
#cross-references MUID:86016731
#accession  A01386
#molecule_type protein
#residues   12-157 #label ESC
#experimental_source pituitary gland
REFERENCE
#authors    Baird, A.; Esch, F.; Bohlen, P.; Ling, N.; Gospodarowicz, D.
            Regul. Pept. (1985) 12:201-213
#journal     Isolation and partial characterization of an endothelial cell
            growth factor from the bovine kidney: homology with basic
            fibroblast growth factor.
#cross-references MUID:86095426
#accession  A60316
#molecule_type protein
#residues   27-35,'X',37-43 #label BAI
#experimental_source kidney
REFERENCE
#authors    Bohlen, P.; Baird, A.; Esch, F.; Ling, N.; Gospodarowicz, D.
            Proc. Natl. Acad. Sci. U.S.A. (1984) 81:5364-5368
#journal     Isolation and partial molecular characterization of pituitary
            fibroblast growth factor.
#cross-references MUID:84298139
#accession  A22054
#molecule_type protein
#residues   12-26 #label BOH
COMMENT     The acidic and basic fibroblast growth factors are the major
            endothelial-cell growth factors. Both are angiogenic agents in
            vivo and are potent mitogens for a variety of mesoderm-derived
            cell types in vitro (although bFGF is 30-100 times more potent
            than aFGF in stimulating the proliferation of normal diploid
            cells).
COMMENT     This protein binds heparin more strongly than does aFGF.
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS       alternative splicing; angiogenesis; growth factor; heparin
            binding; mitogen
FEATURE
1-157         #product basic fibroblast growth factor, uterine form
4-157         #status predicted #label MAT1\
            #product basic fibroblast growth factor, pituitary gamma
            form #status experimental #label MAT2\
12-157        #product basic fibroblast growth factor, pituitary alpha
            form #status experimental #label MAT3\
16-157        #product basic fibroblast growth factor, pituitary short
            form #status predicted #label MAT4\
23-157        #product basic fibroblast growth factor, hepatic form
            #status experimental #label MAT5\
27-157        #product basic fibroblast growth factor, renal form

```

```

29-33,118-121 #status experimental #label MAT6\
4             #region heparin binding #status predicted\
            #modified_site blocked amino end (Ala) (in mature form
            pituitary gamma) (probably acetylated) #status
            experimental
SUMMARY      #length 157 #checksum 1115
Query Match 32.48; Score 516; DB 1; Length 157;
Best Local Similarity 55.28; Pred. No. 3.12e-82;
Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;
Db 26 GHFKDPRRLCKKGGFLRIHPDGRVDGVRKSDPHIKLQQAEEGWISIKVCANRYL 85
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Qy 87 ANYKKPKLLYCSNGGHEFLRLPDGTVDGTRDSQDHLQLQLSAESVGEVYIKSTETQYL 146
Db 86 AMKEDGRLLASKCVTDCEFFERLESNNYTYRSKYV--SWYVALKRTQYKLGPKTGP 143
      ||::|::|::|::|::|::|::|::|::|::|::|::|::|::|::|::|::|::|::|
Qy 147 AMDTDGLLYGSQTPNEBCLERLEENHYNTYISKHAENWFWGLKKGSKRGPRTHY 206
Db 144 GKAKILFLPMSAKS 157
      ||::|::|::|::|::|::|::|::|::|::|::|::|::|::|::|::|::|::|::|
Qy 207 GKAKILFLPLPVSS 220

RESULT 13      A32398      #type complete
ENTRY         basic fibroblast growth factor precursor, 22.5K form - human
TITLE         bFGF; fibroblast growth factor 2; prostatic growth factor;
ALTERNATE_NAMES      prostatin
CONTAINS      basic fibroblast growth factor, 18K form
ORGANISM      #formal_name Homo sapiens #common_name man
DATE          31-Jul-1989 #sequence_revision 31-Dec-1993 #text_change
              16-Jul-1999
ACCESSIONS    A32398; A61537; A26642; B32878; S00297; A54316; B54316;
              A33624; A25824; B24243; B24301; S42242; B55784; I52267;
              S46253
REFERENCE     A32398
#authors      Prats, H.; Kaghad, M.; Prats, A.C.; Klagsbrun, M.; Lelias,
              J.M.; Liauzun, P.; Chalon, P.; Tauber, J.P.; Amalric, F.;
              Smith, J.A.; Caput, D.
#journal      Proc. Natl. Acad. Sci. U.S.A. (1989) 86:1836-1840
#title        High molecular mass forms of basic fibroblast growth factor
              are initiated by alternative CUG codons.
#cross-references MUID:89184522
#accession    A32398
#molecule_type mRNA
#residues     1-210 #label PRA
#cross-references GB:J04513; NID:g183083; PIDN:AAA52531.1; PID:g459811
REFERENCE     A61537
#authors      Shibata, F.; Baird, A.; Florkiewicz, R.Z.
#journal      Growth Factors (1991) 4:277-287
#title        Functional characterization of the human basic fibroblast
              growth factor gene promoter.
#cross-references MUID:92110035
#accession    A61537
#molecule_type DNA
#residues     1-114 #label SHI
#note         authors translated the codon GGA for residue 47 as Ala
REFERENCE     A26642
#authors      Kurokawa, T.; Sasada, R.; Iwane, M.; Igarashi, K.
#journal      FEBS Lett. (1987) 213:189-194
#title        Cloning and expression of cDNA encoding human basic
              fibroblast growth factor.
#cross-references MUID:87162468
#accession    A26642
#molecule_type mRNA
#residues     56-210 #label KUR
#cross-references GB:M27968; NID:g182562; PIDN:AAA52448.1; PID:g182563
REFERENCE     A90924
#authors      Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes,
              J.C.
#journal      Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668
#title        Human basic fibroblast growth factor: nucleotide sequence,

```

```

#cross-references MUID:87217066
#accession B32878
#molecule_type mRNA
#residues 56-210 #label ABR
#note the authors translated the codon GAA for residue 108 as Gly

REFERENCE
#authors S00297
#journal Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Friedman, J.; Gospodarowicz, D.; Fiddes, J.C.
#journal EMBO J. (1986) 5:2523-2528
#title Human basic fibroblast growth factor: nucleotide sequence and genomic organization.
#cross-references MUID:87053817
#accession S00297
#status not compared with conceptual translation
#molecule_type DNA
#residues 1-155 #label AB2
#note the authors translated the codon GAA for residue 108 as Gly

ERENCE
A54316
#authors Shimoyama, Y.; Gotoh, M.; Ino, Y.; Sakamoto, M.; Kato, K.; Hirohashi, S.
#journal Jpn. J. Cancer Res. (1991) 82:1263-1270
#title Characterization of high-molecular-mass forms of basic fibroblast growth factor produced by hepatocellular carcinoma cells: possible involvement of basic fibroblast growth factor in hepatocarcinogenesis.
#cross-references MUID:92091228
#accession A54316
#molecule_type protein
#residues 'XX', '86-88', 'X', '90-91', 'X', '93-95' #label SH3
#experimental_source C-Li21 hepatocellular carcinoma cell line
#note #experimental_source sequence extracted from NCBI backbone (NCBIP:71595)

#accession B54316
#molecule_type protein
#residues 'XXX', '19', 'X', '21-29' #label SH2
#note sequence extracted from NCBI backbone (NCBIP:71594)

REFERENCE
A33624
#authors Feige, J.J.; Bradley, J.D.; Fryburg, K.; Farris, J.; Cousens, L.C.; Barr, P.J.; Baird, A.
#journal J. Cell Biol. (1989) 109:3105-3114
#title Differential effects of heparin, fibronectin, and laminin on the phosphorylation of basic fibroblast growth factor by protein kinase C and the catalytic subunit of protein kinase A.
#cross-references MUID:90078343
#accession A33624
#status preliminary
#molecule_type protein
#residues 57-210 #label FEI

REFERENCE
A25824
#authors Story, M.T.; Esch, F.; Shimasaki, S.; Sasse, J.; Jacobs, S.C.; Lawson, R.K.
#journal Biochem. Biophys. Res. Commun. (1987) 142:702-709
#title Amino-terminal sequence of a large form of basic fibroblast growth factor isolated from human benign prostatic hyperplastic tissue.
#cross-references MUID:87156686
#accession A25824
#molecule_type protein
#residues 57-77 #label STO
#experimental_source prostate

REFERENCE
A90122
#authors Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal Biochem. Biophys. Res. Commun. (1986) 135:541-548
#title Human brain-derived acidic and basic fibroblast growth factors: amino terminal sequences and specific mitogenic activities.
#cross-references MUID:86186784
#accession B24243
#molecule_type protein
#residues 65-102, 'X', '104-105' #label GIM

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#experimental_source brain
REFERENCE
A91364
#authors Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
#journal FEBS Lett. (1986) 204:203-207
#title Partial molecular characterization of endothelial cell mitogens from human brain: acidic and basic fibroblast growth factors.
#cross-references MUID:86275260
#accession B24301
#molecule_type protein
#residues 65-88, 'X', '90-98', 'X', '100' #label GAU

REFERENCE
S42242
#authors Sommer, A.; Brewer, M.T.; Thompson, R.C.; Moscatelli, D.; Presta, M.; Rifkin, D.B.
#journal Biochem. Biophys. Res. Commun. (1987) 144:543-550
#title A form of human basic fibroblast growth factor with an extended amino terminus.
#cross-references MUID:87213238
#accession S42242
#status preliminary
#molecule_type mRNA
#residues 54-210 #label SOM
#cross-references EMBL:M17599; NID:g183086; PIDN:AAA52534.1; PID:g183087

REFERENCE
A5784
#authors Pantoliano, M.W.; Horlick, R.A.; Springer, B.A.; Van Dyk, D.E.; Tobery, T.; Wetmore, D.R.; Lear, J.D.; Nahapetian, A.T.; Bradley, J.D.; Sisk, W.P.
#journal Biochemistry (1994) 33:10229-10248
#title Multivalent ligand-receptor binding interactions in the fibroblast growth factor system produce a cooperative growth factor and heparin mechanism for receptor dimerization.
#cross-references MUID:94347757
#accession B55784
#molecule_type protein
#residues 54-71 #label PAN

REFERENCE
I52267
#authors Watson, R.; Anthony, F.; Pickett, M.; Lambden, P.; Masson, G.M.; Thomas, E.J.
#journal Biochem. Biophys. Res. Commun. (1992) 187:1227-1231
#title Reverse transcription with nested polymerase chain reaction shows expression of basic fibroblast growth factor transcripts in human granulosa and cumulus cells from in vitro fertilisation patients.
#cross-references MUID:93038590
#accession I52267
#status preliminary; translated from GB/EMBL/DDBB
#molecule_type mRNA
#residues 95-182 #label RES
#cross-references GB:S47380; NID:g256535
#experimental_source granulosa cells

REFERENCE
S46253
#authors Patry, V.; Bugler, B.; Amalric, F.; Prome, J.C.; Prats, H.
#journal FEBS Lett. (1994) 349:23-28
#title Purification and characterization of the 210-amino acid recombinant basic fibroblast growth factor form (FGF-2).
#cross-references MUID:94320639
#accession S46253
#molecule_type protein
#residues 39-53; 65-88 #label PAT
#note recombinant gene expressed in Escherichia coli

GENETICS
#gene GDB:FGF2; FGFb
#cross-references GDB:I19910; OMIM:134920
#map_position 4q25-4q27
#start_codon CTG
CLASSIFICATION
#superfamily fibroblast growth factor
KEYWORDS
#alternative initiators; angiogenesis; growth factor; heparin binding; mitogen

FEATURE
1-210
#product basic fibroblast growth factor, 22.5K form
#status predicted #label MA2\

```

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65-210      #product basic fibroblast growth factor, 18K form
82-86      #status predicted #label MAT\
171-174    #region heparin binding #status predicted\
SUMMARY    #region heparin binding #status predicted
           #length 210 #molecular-weight 22623 #checksum 3610
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Best Local Similarity 54.5%; Pred. No. 9,93e-81;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

Db 79 GHFKDPKRLKCKNGGFFLRHPDGRVDGVREKSDPHIKLQLOAEERGVSIGKVCANRYL 138
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Qy 87 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDSQHIQLOLSAESVGEVIKSTETGYL 146
   ::||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||

Db 139 AMKEDGRLASKCVTDECFERLESNNYTSRKYI--SWYVALKRTGYKLGSKTGP 196
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Qy 147 AMTDLGLYGSQTPNEECFLERLEENHYNTYISKHAENKWFVGLKNGSKCRGRPTHY 206
   || ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||

Db 197 GOKAILFLPMSAKS 210
   || ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
207 GOKAILFLPVPSS 220
   || ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||

RESULT 14
ENTRY      A31674      #type complete
TITLE      basic fibroblast growth factor precursor - rat
ALTERNATE_NAMES bFGF
ORGANISM    #formal_name Rattus norvegicus #common_name Norway rat
DATE        21-May-1990 #sequence_revision 21-May-1990 #text_change
16-Jul-1999
ACCESSIONS A31674; S00876; S24309
REFERENCE   A31674
#authors    Shimasaki, S.; Emoto, N.; Koba, A.; Mercado, M.; Shibata, F.;
#journal     Cooksey, K.; Baird, A.; Ling, N.
#title       Biochem. Biophys. Res. Commun. (1988) 157:256-263
#title       Complementary DNA cloning and sequencing of rat ovarian basic
#title       fibroblast growth factor and tissue distribution study of
#title       its mRNA.
#cross-references MUID:89061721
#accession   A31674
#molecule_type mRNA
#residues    1-154 #label SHI
#cross-references GB:M22427; NID:G204285; PIDN:AAA41210.1; PID:G204286
REFERENCE    S00876
#authors     Kurokawa, T.; Seno, M.; Igarashi, K.
#journal     Nucleic Acids Res. (1988) 16:5201
#title       Nucleotide sequence of rat basic fibroblast growth factor
#title       cDNA.
#cross-references MUID:88262516
#accession   S00876
#molecule_type mRNA
#residues    1-154 #label KUR
#cross-references EMBL:X07285; NID:G56203; PIDN:CAA30265.1; PID:G56204
REFERENCE    S24309
#authors     El-Husseini, A.E.D.; Paterson, J.A.; Myal, Y.; Shiu, R.P.C.
#journal     Biochim. Biophys. Acta (1992) 1131:314-316
#title       PCR detection of the rat brain basic fibroblast growth factor
#title       (bFGF) mRNA containing a unique 3' untranslated region.
#cross-references MUID:92329546
#accession   S24309
#status      preliminary; translation not shown
#molecule_type mRNA
#residues    35-154 #label ELH
#cross-references EMBL:X61697; NID:G56143; PIDN:CAA43863.1; PID:G56144
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS      growth factor
FEATURE       1-9      #domain signal sequence #status predicted #label SIG\
10-154      #product basic fibroblast growth factor #status
              predicted #label MAT\
SUMMARY       #length 154 #molecular-weight 17139 #checksum 3026
              #length 154 #molecular-weight 17139 #checksum 3026

Query Match 31.9%; Score 508; DB 2; Length 154;
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Best Local Similarity 54.5%; Pred. No. 1.63e-80;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

Db 23 GHFKDPKRLKCKNGGFFLRHPDGRVDGVREKSDPHVKLQLOAEERGVSIGKVCANRYL 82
   ::||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
Qy 87 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDSQHIQLOLSAESVGEVIKSTETGYL 146
   ::||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||

Db 83 AMKEDGRLASKCVTDECFERLESNNYTSRKYI--SWYVALKRTGYKLGSKTGP 140
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Qy 147 AMTDLGLYGSQTPNEECFLERLEENHYNTYISKHAENKWFVGLKNGSKCRGRPTHY 206
   || ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||

Db 141 GOKAILFLPMSAKS 154
   || ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
Qy 207 GOKAILFLPVPSS 220
   || ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||

RESULT 15
ENTRY      C37360      #type complete
TITLE      basic fibroblast growth factor - mouse
ORGANISM    #formal_name Mus musculus #common_name house mouse
DATE        17-Apr-1993 #sequence_revision 17-Apr-1993 #text_change
16-Jul-1999
ACCESSIONS C37360
REFERENCE   A37360
#authors     Hebert, J.M.; Basilio, C.; Goldfarb, M.; Haub, O.; Martin,
#journal     G.R.
#title       Dev. Biol. (1990) 138:454-463
#title       Isolation of cDNAs encoding four mouse FGF family members and
#title       characterization of their expression patterns during
#title       embryogenesis.
#cross-references MUID:90201563
#accession   C37360
#status      preliminary
#molecule_type mRNA
#residues    1-154 #label HEB
#cross-references GB:M30644; NID:G193296; PIDN:AAA37621.1; PID:G309239
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY       #length 154 #molecular-weight 17153 #checksum 2506

Query Match 31.9%; Score 508; DB 2; Length 154;
Best Local Similarity 54.5%; Pred. No. 1.63e-80;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

Db 23 GHFKDPKRLKCKNGGFFLRHPDGRVDGVREKSDPHVKLQLOAEERGVSIGKVCANRYL 82
   ::||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
Qy 87 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDSQHIQLOLSAESVGEVIKSTETGYL 146
   ::||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||

Db 83 AMKEDGRLASKCVTDECFERLESNNYTSRKYI--SWYVALKRTGYKLGSKTGP 140
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Qy 147 AMTDLGLYGSQTPNEECFLERLEENHYNTYISKHAENKWFVGLKNGSKCRGRPTHY 206
   || ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||

Db 141 GOKAILFLPMSAKS 154
   || ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
Qy 207 GOKAILFLPVPSS 220
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Search completed: Tue Aug 29 15:40:25 2000
Job time : 54 secs.
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\*\*\*\*\*  
W P I R E L A  
\*\*\*\*\*  
(TM)

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MPSrch\_pp protein - protein database search, using Smith-Waterman algorithm  
on: Tue Aug 29 15:40:42 2000; MasPar time 8.10 Seconds  
Tabular output not generated. 646.314 Million cell updates/sec

Title: >US-09-121-017B-1  
Description: (1-221) from US0917017B.pap  
Perfect Score: 1593  
Sequence: 1 NARLRFALLFFVGGVAES.....PRTHYGQKAILFLPLPVSSD 221

Scoring table: PAM 150  
Gap 11

Searched: 188963 seqs, 23686106 residues

Post-processing: Minimum Match 0%  
Listing first 45 summaries

Database: a-geneseq36  
1:geneseqp

Statistics: Mean 32.257; Variance 136.606; scale 0.236

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

§								
Result No.	Score	Query Match	Length	ID	Description			Pred. No.
1	984	61.8	140	1	R25914 Human acidic fibroblas			4.61e-84
2	984	61.8	140	1	R34497 Human acidic Fibroblas			4.61e-84
3	984	61.8	140	1	P90068 Human acid Fibroblast			4.61e-84
4	984	61.8	140	1	R74647 Human recombinant aFGF			4.61e-84
5	984	61.8	140	1	W04806 Human acidic fibroblas			4.61e-84
6	984	61.8	140	1	P70995 Sequence of human prot			4.61e-84
7	984	61.8	141	1	R10527 Human acidic fibroblas			4.61e-84
8	984	61.8	151	1	R05789 Human aFGF encoded by			4.61e-84
9	984	61.8	151	1	W92283 Human beta-endothelial			4.61e-84
10	984	61.8	154	1	W04805 Human beta-endothelial			4.61e-84
11	984	61.8	154	1	W06816 Human endothelial cell			4.61e-84
12	984	61.8	154	1	W75414 Human beta-endothelial			4.61e-84
13	984	61.8	155	1	P94037 Human acidic fibroblas			4.61e-84
14	984	61.8	155	1	R70812 FGF-1			4.61e-84
15	984	61.8	155	1	R70482 Sequence encoded by co			4.61e-84
16	984	61.8	155	1	R80776 Fibroblast growth fact			4.61e-84
17	984	61.8	155	1	W53022 Fibroblast growth fact			4.61e-84
18	984	61.8	155	1	W75711 Fibroblast growth fact			4.61e-84
19	984	61.8	155	1	W75415 Human endothelial cell			4.61e-84
20	984	61.8	155	1	W92291 Human endothelial cell			4.61e-84
21	984	61.8	165	1	R05785 Human BECGF encoded by			4.61e-84
22	984	61.8	168	1	W06818 Human endothelial cell			4.61e-84
23	983	61.7	134	1	W75413 Human alpha-endothelia			5.80e-84

24	983	61.7	134	1	W92282 Human alpha-endothelia	5.80e-84
25	983	61.7	134	1	W04807 Human alpha-endothelia	5.80e-84
26	973	61.1	156	1	W71383 Fibroblast growth fact	5.75e-83
27	972	61.0	135	1	W06817 Human endothelial cell	7.24e-83
28	960	60.3	132	1	R11327 9 N-terminal residue d	1.13e-81
29	960	60.3	132	1	R25418 aFGF mutein #2.	1.13e-81
30	953	59.8	155	1	R25570 Recombinant human Ala1	5.64e-81
31	953	59.8	155	1	W00561 Human (Gly93) aFGF ana	5.64e-81
32	948	59.5	140	1	R65935 Fibroblast growth fact	1.78e-80
33	938	58.9	129	1	R25419 aFGF mutein #3.	1.76e-79
34	938	58.9	129	1	R11328 12 N-terminal residue	1.76e-79
35	923	57.9	140	1	R34496 Bovine acidic fibrobla	5.45e-78
36	923	57.9	140	1	R13030 Brain-derived acidic f	5.45e-78
37	923	57.9	140	1	R74648 Bovine recombinant aFG	5.45e-78
38	923	57.9	140	1	P90069 Bovine acidic fibrobla	5.45e-78
39	923	57.9	140	1	R25915 Human acidic fibroblas	5.45e-78
40	923	57.9	140	1	R65934 Bovine fibroblast grow	5.45e-78
41	921	57.8	154	1	R05315 Human acidic fibroblas	8.62e-78
42	915	57.4	154	1	P90074 Recombinant human muta	3.40e-77
43	912	57.3	141	1	R25569 Recombinant bovine Ala	6.77e-77
44	912	57.3	141	1	W00560 Bovine (Ala47,Gly93) a	6.77e-77
45	900	56.5	136	1	W01747 Chimeric acid/basic fi	1.05e-75

ALIGNMENTS

RESULT 1  
ID R25914 standard; peptide; 140 AA.  
AC R25914; 26-JAN-1993 (first entry)  
DE Human acidic fibroblast growth factor.  
KW human acidic fibroblast growth factor.  
KW herpes simplex virus; HSV-1; HSV-2;  
KW viral infections; viruses; FGF; herpes simplex virus; HSV-1; HSV-2;  
KW human varicella; herpes zoster; cytomegalovirus; Influenza;  
KW human respiratory syncytial virus; Semliki Forest virus; HIV;  
KW human immunodeficiency virus; Moloney Sarcoma virus.  
OS Homo sapiens.  
PN EP-497341-A.  
PD 05-AUG-1992.  
PF 30-JAN-1992; 101541.  
PR 31-JAN-1991; GB-002145.  
PR 09-JAN-1992; GB-000410.  
PR (FARM ) FARMITALIA ERBA SRL CARLO.  
PA Battistini C, Carminati P, Garofano L, Marue G, Ungheri D;  
DI WPI; 92-260792/32.  
PT Synergistic antiviral composition contains: BFGF and sulphated  
PT polysaccharide - for treating viral infections e.g. HSV-1 and -2,  
PT cytomegalovirus, HIV, influenza virus etc.  
PS Disclosure: Page 4; 20pp; English.  
CC This sequence represents acidic fibroblast growth factor (aFGF).  
CC aFGF, or its fragments may be used in a synergistic compsn. with an  
CC antivirally active sulphated polysaccharide, and one or more  
CC excipients. The compsn. may be used to control herpes simplex virus  
CC (HSV-1 or -2) herpes varicella/zoster; cytomegalovirus; Influenza;  
CC human respiratory syncytial virus; Semliki Forest virus; HIV or  
CC Moloney Sarcoma virus. The combination of aFGF with sulphated  
CC polysaccharide is found to have a greater antiviral activity than  
CC expected for an additive effect. See also R25913-5.  
SQ Sequence 140 AA;

Query Match 61.8%; Score 984; DB 1; Length 140;  
Best Local Similarity 99.3%; Pred. No. 4.61e-84;  
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKKPLLYCSNGGHFLRLPDGTVDGTRDSQHQIQLQLSAESVGEVIKSTETGQYL 65  
:|||||  
QY 87 ANTKPKPLLYCSNGGHFLRLPDGTVDGTRDSQHQIQLQLSAESVGEVIKSTETGQYL 146  
:|||||  
Db 66 AMTDGLLYCSQTPNECEQLFLERLEENHYNTYISKHAEKNMFVGLKKNKSGCKRGPRTHY 125  
:|||||  
QY 147 AMTDGLLYCSQTPNECEQLFLERLEENHYNTYISKHAEKNMFVGLKKNKSGCKRGPRTHY 206  
:|||||  
Db 126 GKAILFLPLPVSSD 140  
:|||||

QY 207 GQKAILFLPLPVSSD 221

RESULT 2

ID R34497 standard; protein; 140 AA.

AC R34497;

DT 06-AUG-1993 (first entry)

DE Human acidic fibroblast growth factor.

KW aFGF; muten; glycosylation site; glycoprotein.

OS Homo sapiens.

PN J05076356-A.

PD 30-MAY-1991; 127435.

PF 31-MAY-1990; JP-143388.

PR (TAKE ) TAKEDA CHEM IND LTD.

PA WPI; 93-139564/17.

DR FGF muten prep. useful for therapy of burn or thrombosis - by

PT transformation of lymphocyte-contained animal cell by vector

PT contg. DNA encoding FGF muten

PS Disclosure; Page 3; 23pp; Japanese.

CC The invention covers mutenins of FGF (esp. bFGF) which contain at

CC least one glycosylation site. The mutenins can be used to treat burns

CC and thrombosis.

SQ Sequence 140 AA;

Query Match 61.8%; Score 984; DB 1; Length 140;

Best Local Similarity 99.3%; Pred. No. 4.61e-84;

Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVIKSTETGQYL 65

QY 87 ANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVIKSTETGQYL 146

Db 66 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 125

QY 147 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 206

Db 126 GOKAILFLPLPVSSD 140

QY 207 GQKAILFLPLPVSSD 221

RESULT 3

ID P90068 standard; protein; 140 AA.

AC P90068;

DT 1-NOV-1989 (first entry)

DE Human acid fibroblast growth factor

KW Homo sapiens

OS EP-319052-A.

PN 14-JUN-1989.

PF 14-OCT-1988; 202306.

PR 22-OCT-1987; EP-244431.

PA (MERI) Merck and Co.

PI Thomas Jnr KA, Linemeyer DL;

DR WPI; 89-167092/23.

PT Mutant acidic fibroblast growth factor

PT used for promoting repair of soft tissue, musculoskeletal

PT tissue or vascular or nerve tissue and plasminogen

PT activator prodn.

PS Disclosure; page 4; 36pp; English.

CC Amino acid sequence of human acidic fibroblast growth

CC factor (aFGF). The patent claims mutant forms which have

CC increased biological activity with(out) heparin, and promote

CC cell growth.

SQ Sequence 140 AA;

Query Match 61.8%; Score 984; DB 1; Length 140;

Best Local Similarity 99.3%; Pred. No. 4.61e-84;

Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVIKSTETGQYL 65

QY 87 ANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVIKSTETGQYL 146

Db 66 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 125

QY 147 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 206

Db 126 GOKAILFLPLPVSSD 140

QY 207 GQKAILFLPLPVSSD 221

RESULT 4

ID R74647 standard; protein; 140 AA.

AC R74647;

DT 25-SEP-1995 (first entry)

DE Human recombinant aFGF.

KW Acidic fibroblast growth factor; aFGF; vulnery; angiogenesis;

KW mitogen.

OS Homo sapiens.

PN US5401832-A.

PD 28-MAR-1995.

PF 24-DEC-1984; 685923.

PR 24-DEC-1984; US-685923.

PR 12-SEP-1985; US-774359.

PR 30-MAY-1986; US-868473.

PR 11-JUL-1986; US-884460.

PR 04-JUN-1987; US-054991.

PR 04-MAY-1988; US-190293.

PR 08-FEB-1991; US-654397.

PR 25-SEP-1991; US-765472.

PR 25-SEP-1992; US-951365.

PA (MERI ) MERCK & CO INC.

PI Gimenez-Gallego G, Kelly LJ, Linemeyer DL, Thomas KA;

DR WPI; 95-138983/718.

PT New recombinant human acidic fibroblast growth factor - used to

PT promote cell growth, to promote wound healing, for vascular

PT grafts and blood vessel repair

PS Claim 2; Column 30; 25pp; English.

CC Oligonucleotides were synthesized on the basis of the amino acid

CC sequence of bovine acidic fibroblast growth factor (aFGF) and

CC used to produce a synthetic gene (given in Q88233) incorporating

CC codons preferred by E. coli or mammalian cells, unique cloning

CC sites, etc. This synthetic gene was mutagenized to obtain a gene

CC encoding a human recombinant aFGF (R74647) having activity

CC equivalent to the native protein.

SQ Sequence 140 AA;

Query Match 61.8%; Score 984; DB 1; Length 140;

Best Local Similarity 99.3%; Pred. No. 4.61e-84;

Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVIKSTETGQYL 65

QY 87 ANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVIKSTETGQYL 146

Db 66 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 125

QY 147 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 206

Db 126 GOKAILFLPLPVSSD 140

QY 207 GQKAILFLPLPVSSD 221

RESULT 5

ID W04806 standard; Protein; 140 AA.

AC W04806;

DT 29-DEC-1996 (first entry)

DE Human acidic fibroblast growth factor.

KW Endothelial cell growth factor; ECGF; blood vessel; regeneration;

KW heparin-Sepharose affinity chromatography; probe; oligonucleotide;

KW FGF; fibroblast growth factor; ss.

OS Homo sapiens.



US5552528-A.  
 03-SEP-1996; 835594.  
 03-MAR-1986; US-835594.  
 18-DEC-1987; US-134499.  
 29-APR-1991; US-693079.  
 27-NOV-1991; US-799859.  
 03-NOV-1994; US-334884.  
 (RHON ) RHONE POULENC RORER PHARM INC.  
 Burgess W, Maciag T;  
 WPI: 96-412132/41.  
 N-PSDB: T37503.  
 Isolated, purified, biologically active bovine beta endothelial cell growth factor - useful to regenerate or treat damaged blood vessels  
 Disclosure: Fig 8; 28pp; English.  
 Bovine beta-endothelial cell growth factor (beta-ECGF; W03599) having a mol. wt. of 20 kD can be purified at least 16300 fold from bovine brain using heparin-Sepharose affinity chromatography. ECGF is useful for, among other purposes, diagnostic applications and has potential in the treatment of damaged blood vessels or other endothelial cell-lined structures.  
 Human ECGF (T37503) or fragments may be obtained using oligonucleotides (T37504 and T37508 to T37509) whose design is based on the sequence of bovine alpha- and beta-ECGF.  
 Sequence 140 AA;

Query Match 61.8%; Score 984; DB 1; Length 140;  
 Best Local Similarity 99.3%; Pred. No. 4.61e-84;  
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKKPKLLYCSNGGHFLRLPDGTVDRSDQHILQLSAESVGEVIKSTETGOYL 65  
 :|||||  
 QY 87 ANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHILQLSAESVGEVIKSTETGOYL 146  
 :|||||

Db 66 AMDTDGLLYGSQTPEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 125  
 :|||||  
 QY 147 AMDTDGLLYGSQTPEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 206  
 :|||||

Db 126 GOKAILFLPLPVSSD 140  
 :|||||  
 QY 207 GOKAILFLPLPVSSD 221  
 :|||||

RESULT 7  
 ID R10527 standard; protein; 141 AA.  
 AC R10527;  
 DT 15-APR-1991 (first entry)  
 DE Human acidic fibroblast growth factor gene.  
 KW aFGF; anti-bdy; antigen; cancer; ss.  
 OS Homo sapiens.  
 FH Key Location/Qualifiers  
 FT region 2..12  
 FT /label= A  
 FT region 56..67  
 FT /label= B  
 FT region 104..114  
 FT /label= C  
 FT region 132..141  
 FT /label= D  
 J02306996-A.  
 PD 20-DEC-1390.  
 PF 03-JUL-1389; 172542.  
 PR 04-JUL-1388; JP-166275.  
 PR 03-JUL-1989; JP-172542.  
 PA (TAKE ) TAKEDA CHEMICAL IND KK.  
 DR WPI: 91-040150/06.  
 DR N-PSDB: Q10399.  
 PT Anti-acid antibody, for cancer diagnosis, etc. - is obt'd. by  
 PT using complex of partial peptide(s) of acid fibroblast growth  
 PT factor and protein as antigen.  
 PS Disclosure; Fig 1; 19pp; Japanese.  
 CC The was deduced from a gene used to produce recombinant aFGF.  
 CC Peptides derived from the protein, esp. from A-D can be used to as  
 CC antigens to produce anti-aFGF antibodies. The peptides must  
 CC comprise 8-10 continuous AAs from A or B (claims 5 and 6 resp.),  
 CC 7-10 continuous AAs from C (claim 7), or 8-9 continuous AAs from D  
 CC (claim 8). The AAs can be used for immunochemically measuring aFGF,  
 CC and for purifying aFGF. They are useful as reagents in the diag-  
 CC nosis of various cancers or diseases of the CNS. Purified aFGF  
 CC has wound healing and nerve cell proliferating properties.  
 SQ Sequence 141 AA;

Query Match 61.8%; Score 984; DB 1; Length 141;  
 Best Local Similarity 99.3%; Pred. No. 4.61e-84;  
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 7 GNYKKPKLLYCSNGGHFLRLPDGTVDRSDQHILQLSAESVGEVIKSTETGOYL 66  
 :|||||  
 QY 87 ANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHILQLSAESVGEVIKSTETGOYL 146  
 :|||||

Db 67 AMDTDGLLYGSQTPEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 126  
 :|||||  
 QY 147 AMDTDGLLYGSQTPEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 206  
 :|||||

Db 127 GOKAILFLPLPVSSD 141  
 :|||||  
 QY 207 GOKAILFLPLPVSSD 221  
 :|||||

RESULT 8

50 Query  
 100  
 150  
 200  
 250  
 300  
 350  
 400  
 450  
 500  
 550  
 600  
 650  
 700  
 750  
 800  
 850  
 900  
 950  
 1000

IO5789 standard; Protein; 151 AA.  
AC R05789;  
DE 22-AUG-1990 (first entry)  
KW Human aFGF encoded by synthetic gene.  
KW Acidic fibroblast growth factor; aFGF; thrombogenesis;  
KW atherosclerosis; tumors.  
OS Synthetic.  
FH Key Location/Qualifiers  
FT misc\_difference 146..147  
FT /note= "sites corresp. to two stop codons of  
FT the DNA sequence"  
PD GB223496-A.  
PD 11-APR-1990.  
PD 08-AUG-1988; 018775.  
PD 08-AUG-1988; GB-018775.  
PA (BRI-) Brit Bio-Tech Ltd.  
PI Davies JA, Johnson ID;  
DR WPI; 90-109882/15.  
DR N-PSDB; Q03873.  
DE Gene encoding human acidic fibroblast growth factor -  
DE incorporates useful restriction sites at frequent intervals to  
DE facilitate cassette mutagenesis of specified regions.  
PS Claim 2; Fig 3a; 12pp; English.  
CC The synthetic aFGF gene incorporates useful restriction sites at  
CC frequent intervals to facilitate the cassette mutagenesis of  
CC selected regions. Also included are flanking sites to simplify  
CC the incorporation of the gene into any expression system.  
CC The aFGF mol. acts in a cascade effect to control endothelial cell  
CC activity either co-ordinately through synergistic effects or via  
CC independent routes. The regulation of endothelial cells is essential  
CC for the protection of arteries, veins and capillaries from the effect  
CC of thrombogenesis. Their stimulation and control by these factors is  
CC also thought to be important in the development of tumours and  
CC atherosclerosis.  
SQ Sequence 151 AA;  
Query Match 61.8%; Score 984; DB 1; Length 151;  
Best Local Similarity 99.3%; Pred. No. 4.61e-84;  
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;  
Db 11 GNYKPKLLYCSNGGHFLRILPDGTVDRSDQHILQLLSAESVGEVYIKSTGTGYL 70  
QY :|||||  
Db 71 AMDTGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPRTHY 130  
QY 147 AMDTGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPRTHY 206  
131 GQKAILFLPLPVSSD 145  
207 GQKAILFLPLPVSSD 221  
RESULT 9  
ID W92283 standard; protein; 154 AA.  
AC W92283;  
DE 20-APR-1999 (first entry)  
DE Human beta-endothelial cell growth factor (ECGF) protein sequence.  
KW Endothelial cell growth factor; ECGF; cleavable; recombinant; repair;  
KW regenerate; blood vessel; endothelial cell; human.  
OS Homo sapiens.  
PN US5849538-A.  
PD 15-DEC-1998.  
PD 11-APR-1997;  
PR 03-MAR-1986; US-743261.  
PR 03-MAR-1986; US-835594.  
PR 18-DEC-1987; US-134499.  
PR 29-APR-1991; US-693079.  
PR 27-NOV-1991; US-799859.  
PR 03-NOV-1994; US-334884.  
PR 07-JUN-1995; US-472964.  
PR 11-APR-1997; US-840088.  
PA (RHON ) RHONE-POULENC RORER PHARM INC.  
Query Match 61.8%; Score 984; DB 1; Length 154;  
Best Local Similarity 99.3%; Pred. No. 4.61e-84;  
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;  
Db 20 GNYKPKLLYCSNGGHFLRILPDGTVDRSDQHILQLLSAESVGEVYIKSTGTGYL 79  
QY :|||||  
Db 20 GNYKPKLLYCSNGGHFLRILPDGTVDRSDQHILQLLSAESVGEVYIKSTGTGYL 79  
QY 87 ANYKPKLLYCSNGGHFLRILPDGTVDRSDQHILQLLSAESVGEVYIKSTGTGYL 146  
Db 80 AMDTGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPRTHY 139  
QY 147 AMDTGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPRTHY 206  
140 GQKAILFLPLPVSSD 154  
207 GQKAILFLPLPVSSD 221  
RESULT 10  
ID W04805 standard; Protein; 154 AA.  
AC W04805;  
DE 29-DEC-1996 (first entry)  
DE Human beta-endothelial cell growth factor.  
KW Endothelial cell growth factor; ECGF; blood vessel; regeneration;  
KW heparin-sepharose affinity chromatography; probe; oligonucleotide;  
KW FGF; fibroblast growth factor.  
OS Homo sapiens.  
PN US552528-A.  
PD 03-SEP-1996.  
PD 03-MAR-1986; 835594.  
PR 03-MAR-1986; US-835594.  
PR 18-DEC-1987; US-134499.  
PR 29-APR-1991; US-693079.  
PR 27-NOV-1991; US-799859.  
PR 03-NOV-1994; US-334884.  
PA (RHON ) RHONE-POULENC RORER PHARM INC.  
PI Burgess W, Maciag T;  
DR WPI; 96-412132/41.  
DR N-PSDB; T37503.  
DE Isolated, purified, biologically active bovine beta endothelial cell  
DE growth factor - useful to regenerate or treat damaged blood vessels  
DE Disclosure; Fig 8; 28pp; English.  
PS Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having  
CC a mol.wt. of 20 kD can be purified at least 16300 fold from bovine  
CC brain using heparin-sepharose affinity chromatography. ECGF is  
CC useful for, among other purposes, diagnostic applications and has  
CC potential in the treatment of damaged blood vessels or other  
CC endothelial cell-lined structures.  
CC Human ECGF (T37503) or fragments may be obtained using  
CC oligonucleotides (T37504 and T37508 to T37509) whose design is based  
CC on the sequence of bovine alpha- and beta-ECGF.  
SQ Sequence 154 AA;  
Query Match 61.8%; Score 984; DB 1; Length 154;  
Best Local Similarity 99.3%; Pred. No. 4.61e-84;  
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;  
Db 20 GNYKPKLLYCSNGGHFLRILPDGTVDRSDQHILQLLSAESVGEVYIKSTGTGYL 79  
QY :|||||

QY 87 ANYKKPKLLYCSNGGHFLRLIPDGTVDGTRDRSDQHIQLA:SAESVGEVYIKSTETGOYL 146  
 Db 80 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEK:WFGVGLKNGSKCRGPRTHY 139  
 :|||||  
 QY 147 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEK:WFGVGLKNGSKCRGPRTHY 206  
 :|||||  
 Db 140 GOKAILFLPLPVSSD 154  
 :|||||  
 QY 207 GOKAILFLPLPVSSD 221  
 :|||||

## RESULT 11

ID W06816 standard; Protein; 154 AA.  
 AC W06816;  
 DT 17-MAR-1997 (first entry)  
 DE Human endothelial cell growth factor-beta.  
 KW Endothelial cell growth factor-beta; ECGF-beta.  
 OS Homo sapiens.  
 RN US5571790-A.  
 IN 05-NOV-1996.  
 PR 03-MAR-1986; 835594.  
 PR 03-MAR-1986; US-835594.  
 PR 18-DEC-1987; US-134499.  
 PR 29-APR-1991; US-693079.  
 PR 27-NOV-1991; US-799859.  
 PR 03-NOV-1994; US-334884.  
 PR 07-JUN-1995; US-472964.  
 PA (RHON ) RHONE POULENC RORER PHARM INC.  
 PI Burgess W, Drohan WN, Jaye M, Maciag T;  
 DR WPI; 96-305421/50.  
 DR N-PSDB; T45983.  
 PT Recombinant human endothelial cell growth factors - for treating  
 damaged blood vessels, etc.  
 PS Claim 1; Column 16; 22pp; English.  
 CC Human recombinant endothelial cell growth factors (ECGF) beta  
 CC (W06816) and alpha (W06817) differ only at their N-terminal ends.  
 CC They can be produced in transformed prokaryotic or eukaryotic host  
 CC cells using DNA sequences (T45983 and T45984, respectively) derived  
 CC from the complete human ECGF cDNA (T45985). Large quantities of  
 CC the ECGFs are produced by culturing the host cells and recovering  
 CC the proteins. ECGFs have utility in the growth and amplification  
 CC of endothelial cells in culture. They can potentially be used to  
 CC treat damaged blood vessels and other endothelial cell-lined  
 CC structures, and also have diagnostic applns.  
 SQ Sequence 154 AA;

Query Match 61.8%; Score 984; DB 1; Length 154;  
 Best Local Similarity 99.3%; Pred. No. 4.61e-84;  
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 20 GNYKKPKLLYCSNGGHFLRLIPDGTVDGTRDRSDQHIQLA:SAESVGEVYIKSTETGOYL 79  
 :|||||  
 QY 87 ANYKKPKLLYCSNGGHFLRLIPDGTVDGTRDRSDQHIQLA:SAESVGEVYIKSTETGOYL 146  
 :|||||  
 Db 80 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEK:WFGVGLKNGSKCRGPRTHY 139  
 :|||||  
 QY 147 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEK:WFGVGLKNGSKCRGPRTHY 206  
 :|||||  
 Db 140 GOKAILFLPLPVSSD 154  
 :|||||  
 QY 207 GOKAILFLPLPVSSD 221  
 :|||||

## RESULT 12

ID W75414 standard; Protein; 154 AA.  
 AC W75414;  
 DT 02-MAR-1999 (first entry)  
 DE Human beta-endothelial cell growth factor.  
 KW Human; endothelial cell growth factor; ECGF; brain stem; probe;  
 KW hybridisation; bovine; wound healing; prosthetic device.  
 OS Homo sapiens.  
 RN US5827826-A.  
 IN 27-OCT-1998.

PF 04-NOV-1996; 74324  
 PR 04-NOV-1996; US-7-3261.  
 PR 03-MAR-1986; US-835594.  
 PR 18-DEC-1987; US-134499.  
 PR 29-APR-1991; US-693079.  
 PR 27-NOV-1991; US-799859.  
 PR 03-NOV-1994; US-334884.  
 PR 07-JUN-1995; US-472964.  
 PA (RHON ) RHONE-POULENC RORER PHARM INC.  
 PI Burgess W, Drohan WN, Jaye M, Maciag T;  
 DR WPI; 98-594032/50.  
 PT Compositions for promoting wound healing - containing endothelial  
 PT cell growth factor; polypeptides  
 PS Claim 1; Column 15; 23pp; English.  
 CC This sequence represents the amino acid sequence of the mature human  
 CC beta-endothelial cell growth factor (b-ECGF). This amino acid sequence  
 CC is identical to the alpha-ECGF but the beta sequence contains an extra  
 CC 20 N-terminal amino acids. The sequence was isolated from a human brain  
 CC stem cell cDNA library using a probe designed based on fragments of the  
 CC bovine ECGF (see W75416-W75418). The ECGF protein can be used in  
 CC compositions for promoting wound healing. ECGF is also used to grow  
 CC cells on a prosthetic device.  
 SQ Sequence 154 AA;

Query Match 61.8%; Score 984; DB 1; Length 154;

Best Local Similarity 99.3%; Pred. No. 4.61e-84;  
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 20 GNYKKPKLLYCSNGGHFLRLIPDGTVDGTRDRSDQHIQLA:SAESVGEVYIKSTETGOYL 79  
 :|||||  
 QY 87 ANYKKPKLLYCSNGGHFLRLIPDGTVDGTRDRSDQHIQLA:SAESVGEVYIKSTETGOYL 146  
 :|||||  
 Db 80 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEK:WFGVGLKNGSKCRGPRTHY 139  
 :|||||  
 QY 147 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEK:WFGVGLKNGSKCRGPRTHY 206  
 :|||||  
 Db 140 GOKAILFLPLPVSSD 154  
 :|||||  
 QY 207 GOKAILFLPLPVSSD 221  
 :|||||

## RESULT 13

ID P94037 standard; Protein; 155 AA.  
 AC P94037;  
 DT 25-JUN-1990 (first entry)  
 DE Human acidic fibroblast growth factor.  
 KW Acidic fibroblast growth factor.  
 OS Homo sapiens.  
 RN EP-298723-A.  
 IN 11-JAN-1989.  
 PR 06-JUL-1988; 306158.  
 PR 07-JUL-1987; US-070797.  
 PA (BIOT-) Biotechn Res Assoc.  
 PI Fiddes JC, Abraham JA, Protter A;  
 DR WPI; 89-009785/02.  
 DR N-PSDB; N93088.  
 PT Recombinant DNA encoding new fibroblast growth factor  
 PT analogues - useful eg for accelerating wound healing and  
 PT to control neovascularisation.  
 PS Disclosure; p; English.  
 CC See also P94038.  
 SQ Sequence 155 AA;

Query Match 61.8%; Score 984; DB 1; Length 155;

Best Local Similarity 99.3%; Pred. No. 4.61e-84;  
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLIPDGTVDGTRDRSDQHIQLA:SAESVGEVYIKSTETGOYL 80  
 :|||||  
 QY 87 ANYKKPKLLYCSNGGHFLRLIPDGTVDGTRDRSDQHIQLA:SAESVGEVYIKSTETGOYL 146  
 :|||||  
 Db 81 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEK:WFGVGLKNGSKCRGPRTHY 140  
 :|||||

QY 147 AMDTDGLLYGSGTNPNECLFLERLEENHNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 206  
 Db 141 GOKAILFLPLPVSSD 155  
 QY 207 GOKAILFLPLPVSSD 221

## RESULT 14

ID R70812 standard; protein; 155 AA.  
 AC R70812;  
 DT 01-SEP-1995 (first entry)  
 DE FGF-1;  
 KW FGF-1; fibroblast growth factor; cytotoxic conjugate; fusion protein;  
 KW saporin; cytostatic; tumor; diabetes; rheumatoid arthritis.  
 OS Homo sapiens.  
 FH Key Location/Qualifiers  
 FT misc\_difference 31  
 FT misc\_difference 132 /note= "Cys may be replaced by Ser"  
 FT misc\_difference 132 /note= "Cys may be replaced by Ser"  
 WO9503831-A.  
 09-FEB-1995.  
 PF 27-JUL-1994; U08511.  
 PR 02-AUG-1993; US-099924.  
 PR 29-OCT-1993; US-145829.  
 PA (PRIZ-) PRIZM PHARM INC.  
 PA (WHIT-) WHITTIER INST DIABETES & ENDOCRINOLOGY.  
 PI Baird AJ, Lappi DA, Sosnowski BA;  
 WPI: 95-082038/11.  
 PT New monogenous preparations of cytotoxic conjugates and DNA -  
 PT contain fibroblast growth factors and cytotoxic agents for  
 PT treating FGF conditions such as tumours, diabetes and rheumatoid  
 PT arthritis.  
 PS Disclosure: Page 108-109; 128pp; English.  
 CC Novel fusion proteins comprise FGF linked to saporin. FGF-1 to -9  
 CC may be used, pref. FGF-1 (R70812), FGF-5 (R70813), FGF-7 (R70814) or  
 CC FGF-8 (R70815) muteins, in which at least 1 Cys residue is replaced  
 CC by conservative Ser substitutions. The fusion proteins are potent  
 CC cytotoxic agents to cells bearing the FGF receptor.  
 SQ Sequence 155 AA;

Query Match 61.8%; Score 984; DB 1; Length 155;  
 Best Local Similarity 99.3%; Pred. No. 4.61e-84;  
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;  
 Db: 21 GNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 80  
 QY: 87 ANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 146  
 81 AMDTDGLLYGSGTNPNECLFLERLEENHNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 140  
 QY 147 AMDTDGLLYGSGTNPNECLFLERLEENHNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 206  
 Db 141 GOKAILFLPLPVSSD 155  
 QY 207 GOKAILFLPLPVSSD 221

## RESULT 15

ID P70482 standard; protein; 155 AA.  
 AC P70482;  
 DT 13-MAY-1991 (first entry)  
 DE Sequence encoded by complete cDNA sequence of human endothelial  
 DE cell growth factor (ECGF).  
 KW Endothelial cell regeneration; blood vessel regeneration.  
 OS Homo sapiens.  
 FH Key Location/Qualifiers  
 FT protein 2..15  
 FT /label= Beta ECGF  
 FT protein 16..21  
 FT /label= Acidic FGF  
 FT protein 22..155  
 FT /label= Alpha ECGF

PN WO8705332-A.  
 PD 11-SEP-1987.  
 PF 02-MAR-1987; U00425.  
 PR 03-MAR-1986; US-835594.  
 PR 26-MAR-1987; ES-000812.  
 PA (MELO-) MELOY LAB INC.  
 PA (RORE-) RORER BIOTECHN INC.  
 PA (RORE-) RORER.  
 PA BIOTECH INC.  
 PI Jaye M, Burgess W, Maciag T, Drohan W;  
 DR WPI: 87-264128/37.  
 DR N-PSDB: N70788  
 DR Human endothelial cell growth factor - produced by recombinant  
 PT DNA techniques, useful for wound healing  
 PS Example; Fig 8; 43pp; English.  
 CC To screen the human brain stem cDNA library for clones contg. ECGF  
 CC inserts, a specific oligonucleotide was designed. This  
 CC oligonucleotide was based upon a partial AA sequence analysis of  
 CC the amino terminus of ECGF (see P70480 and P70481). Fig 3c sets  
 CC forth for comprison the AA sequence of cyanogen bromide-cleaved  
 CC bovine alpha and beta ECGF (P70834). The two clones that were  
 CC isolated, ECGF clones 1 and 29, were analysed in further detail. The  
 CC nucleotide sequence of these clones and the AA sequence deduced from  
 CC the nucleic acid sequence is shown in Fig 8 (see N70788 and P70482).  
 SQ Sequence 155 AA;

Query Match 61.8%; Score 984; DB 1; Length 155;  
 Best Local Similarity 99.3%; Pred. No. 4.61e-84;  
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;  
 Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 80  
 QY 87 ANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 146  
 Db 81 AMDTDGLLYGSGTNPNECLFLERLEENHNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 140  
 QY 147 AMDTDGLLYGSGTNPNECLFLERLEENHNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 206  
 Db 141 GOKAILFLPLPVSSD 155  
 QY 207 GOKAILFLPLPVSSD 221

Search completed: Tue Aug 29 15:41:00 2000  
 Job time : 18 secs.

\*\*\*\*\*  
WATERMAN  
(TM)  
\*\*\*\*\*

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MPSrch\_pp protein - protein database search, using Smith-Waterman algorithm  
in on: Tue Aug 29 15:37:43 2000; MasPar time 8.45 Seconds  
Tabular output not generated. 810.692 Million cell updates/sec

Title: >US-09-121-017B-1  
Description: (222) from US09121017B.pep  
Perfect Score: 1213  
Sequence: 1 MAPARLALLFFVGGVAES.....PRTHYGQKAILFLPLPVSSD 221

Scoring table: PAM 150  
Gap 11

Searched: 9551 seqs, 30989116 residues

Post-processing: Minimum Match 0%  
Listing first 45 summaries

Database: ~~swiss-prot38~~  
I:swissprot

Statistics: Mean 46.124; Variance 75.611; scale 0.610

Pred. No. i. the number of results predicted by chance to have a  
score greater than or equal to the score of the result being printed,  
and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description	Pred. No.
1	984	61.9	155	1	FGF1_HUMAN HEPARIN-BINDING GROWTH	2.66e-209
2	972	61.0	155	1	FGF1_MOUSE HEPARIN-BINDING GROWTH	2.88e-206
3	967	60.7	155	1	FGF1_MESAO HEPARIN-BINDING GROWTH	5.29e-205
4	953	59.8	152	1	FGF1_PIG HEPARIN-BINDING GROWTH	1.82e-201
5	923	57.9	155	1	FGF1_BOVIN HEPARIN-BINDING GROWTH	6.80e-194
6	922	57.9	155	1	FGF1_CHICK HEPARIN-BINDING GROWTH	1.21e-193
7	608	38.2	198	1	SDC4_HUMAN SYNDECAN-4 PRECURSOR (	2.38e-115
8	522	32.8	158	1	FGF2_CHICK HEPARIN-BINDING GROWTH	2.34e-94
9	516	32.4	155	1	FGF2_SHEEP HEPARIN-BINDING GROWTH	6.64e-93
10	509	32.0	155	1	FGF2_BOVIN HEPARIN-BINDING GROWTH	6.44e-93
11	509	32.0	155	1	FGF2_HUMAN HEPARIN-BINDING GROWTH	3.28e-91
12	508	31.9	154	1	FGF2_RAT HEPARIN-BINDING GROWTH	5.73e-91
13	508	31.9	154	1	FGF2_MOUSE HEPARIN-BINDING GROWTH	5.73e-91
14	498	31.3	156	1	FGF2_MONDO HEPARIN-BINDING GROWTH	1.49e-88
15	489	30.7	155	1	FGF2_XENLA HEPARIN-BINDING GROWTH	2.21e-86
16	466	29.3	137	1	FGF2_RABIT HEPARIN-BINDING GROWTH	7.44e-81
17	394	24.7	202	1	SDC4_RAT SYNDECAN-4 PRECURSOR (	9.49e-61
18	364	22.8	209	1	FGF9_XENLA GLIA-ACTIVATING FACTOR	9.91e-57
19	360	22.6	208	1	FGF9_MOUSE GLIA-ACTIVATING FACTOR	8.44e-56
20	360	22.6	208	1	FGF9_HUMAN GLIA-ACTIVATING FACTOR	8.44e-56
21	360	22.6	208	1	FGF9_RAT GLIA-ACTIVATING FACTOR	8.44e-56
22	359	22.5	198	1	SDC4_MOUSE SYNDECAN-4 PRECURSOR (	1.44e-55
23	329	20.7	207	1	FGFG_HUMAN FIBROBLAST GROWTH FACT	1.21e-48

24	324	20.3	207	1	FGFG_RAT FIBROBLAST GROWTH FACT	1.69e-47
25	303	19.0	194	1	FGF7_SHEEP KERATINOCYTE GROWTH FA	1.02e-42
26	300	18.8	194	1	FGF7_HUMAN KERATINOCYTE GROWTH FA	4.85e-42
27	296	18.6	194	1	FGF7_MOUSE KERATINOCYTE GROWTH FA	3.87e-41
28	288	18.1	187	1	FGFA_XENLA FIBROBLAST GROWTH FACT	2.44e-39
29	286	18.0	215	1	FGFA_RAT FIBROBLAST GROWTH FACT	6.84e-39
30	280	17.6	208	1	FGFA_HUMAN FIBROBLAST GROWTH FACT	1.50e-37
31	275	17.3	192	1	FGFB_XENLA FIBROBLAST GROWTH FACT	1.95e-36
32	276	17.3	194	1	FGFB_CHICK FIBROBLAST GROWTH FACT	1.17e-36
33	274	17.2	247	1	FGFE_MOUSE FIBROBLAST GROWTH FACT	3.25e-36
34	274	17.2	264	1	FGF5_MOUSE FIBROBLAST GROWTH FACT	3.25e-36
35	272	17.2	266	1	FGF5_RAT FIBROBLAST GROWTH FACT	3.25e-36
36	272	17.1	194	1	FGF7_RAT KERATINOCYTE GROWTH FA	9.05e-36
37	273	17.1	209	1	FGFA_MOUSE FIBROBLAST GROWTH FACT	5.43e-36
38	273	17.1	247	1	FGFE_HUMAN FIBROBLAST GROWTH FACT	5.43e-36
39	269	16.9	268	1	FGF5_HUMAN FIBROBLAST GROWTH FACT	4.18e-35
40	267	16.8	256	1	FGF3_BRARE FIBROBLAST GROWTH FACT	1.16e-34
41	266	16.7	206	1	FGF4_BOVIN FIBROBLAST GROWTH FACT	1.93e-34
42	263	16.5	225	1	FGFB_MOUSE FIBROBLAST GROWTH FACT	8.85e-34
43	257	16.1	225	1	FGFB_MOUSE FIBROBLAST GROWTH FACT	1.85e-32
44	256	16.1	243	1	FGFC_HUMAN FIBROBLAST GROWTH FACT	3.06e-32
45	255	16.0	206	1	FGF4_HUMAN FIBROBLAST GROWTH FACT	5.07e-32

ALIGNMENTS

RESULT 1  
ID FGF1\_HUMAN STANDARD; PRT; 155 AA.  
AC P05230; P07502;  
DT 13-AUG-1987 (Rel. 05, Created)  
DT 13-AUG-1987 (Rel. 05, Last sequence update)  
DT 15-JUL-1999 (Rel. 38, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (ATGF) (BETA-ENDOTHELIAL CELL GROWTH FACTOR) (ECGF-BETA).  
GN FGF1 OR FGFA.  
OS Homo sapiens (Human).  
OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Primates; Catarrhini; Hominiidae; Homo.  
RN [1]  
RP SEQUENCE FROM N.A.  
RX MEDLINE; 86261805.  
RA Jaye M., Hawk E., Burgess W., Ricca G.A., Chiu I.-M., Ravera M.W., O'Brien S.J., Modi W.S., Maciag T., Drohan W.N.;  
RT "Human endothelial cell growth factor: cloning, nucleotide sequence, and chromosome localization.";  
RL Science 233:541-545(1986).  
RN [2]  
RP SEQUENCE FROM N.A.  
RC TISSUE=BRAIN STEM;  
RX MEDLINE; 89343957.  
RA Wang W.P., Lehtoma K., Varban M.L., Krishnan I., Chiu I.M.;  
RT "Cloning of the gene coding for human class I heparin-binding growth factor and its expression in fetal tissues.";  
RL Mol. Cell. Biol. 9:2387-2395(1989).  
RN [3]  
RP SEQUENCE FROM N.A.  
RC TISSUE=BRAIN STEM;  
RX MEDLINE; 90265618.  
RA Chiu I.M., Wang W.P., Lehtoma K.;  
RT "Alternative splicing generates two forms of mRNA coding for human heparin-binding growth factor 1.";  
RL Oncogene 5:755-762(1990).  
RN [4]  
RP SEQUENCE FROM N.A.  
RX MEDLINE; 90073637.  
RA Mergla A., Tischer E., Graves D., Tumolo A., Miller J., Gospodarowicz D., Abraham J.A., Shipley G.D., Fiddes J.C.;  
RT "Structural analysis of the gene for human acidic fibroblast growth factor.";  
RL Biochem. Biophys. Res. Commun. 164:1121-1129(1989).  
RN [5]  
RP SEQUENCE FROM N.A.

RT MEDLINE: 92019819.  
RA Wang W.P., Quick D., Balcerzak S.P., Needleman S.W., Chiu I.M.;  
RT "Cloning and sequence analysis of the human acidic fibroblast growth  
RT factor gene and its preservation in leukemia patients.";  
RL Oncogene 6:1521-1529(1991).  
RN [6]  
RP SEQUENCE FROM N.A.  
RX MEDLINE: 92202857.  
RA Li Y.L., Kha H., Golden J.A., Mischelisen A.A.J., Goetzl E.J.,  
RA Turck E.J.;  
RT "An acidic fibroblast growth factor protein generated by alternate  
RT splicing acts like an antagonist.";  
RL J. Exp. Med. 175:1073-1080(1992).  
RN [7]  
RP SEQUENCE OF 1-154 FROM N.A.  
RX MEDLINE: 94069734.  
RA Zhao X.M., Yeoh T.K., Hiebert M., Frist W.H., Miller G.G.;  
RT "The expression of acidic fibroblast growth factor (heparin-binding  
RT growth factor-1) and cytokine genes in human cardiac allografts and T  
RT cells.";  
RN Transplantation 56:1177-1182(1993).  
RN [8]  
RP SEQUENCE OF 1-40 FROM N.A.  
RX MEDLINE: 90365758.  
RA Crumley G., Dionne C.A., Jaye M.;  
RT "The gene for human acidic fibroblast growth factor encodes two  
RT upstream exons alternatively spliced to the first coding exon.";  
RL Biochem. Biophys. Res. Commun. 171:7-13(1990).  
RN [9]  
RP SEQUENCE OF 16-155.  
RX MEDLINE: 86296647.  
RA Harper J.W., Strydom D.J., Lobb R.R.;  
RT "Human class I heparin-binding growth factor: structure and homology  
RT to bovine acidic brain fibroblast growth factor.";  
RL Biochemistry 25:4097-4103(1986).  
RN [10]  
RP SEQUENCE OF 16-155.  
RX MEDLINE: 86295741.  
RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;  
RT "The complete amino acid sequence of human brain-derived acidic  
RT fibroblast growth factor.";  
RL Biochem. Biophys. Res. Commun. 138:611-617(1986).  
RN [11]  
RP SEQUENCE OF 16-155.  
RX MEDLINE: 87048871.  
RA Gautschi-Sova P., Mueller T., Boehlen P.;  
RT "Amino acid sequence of human acidic fibroblast growth factor.";  
RL Biochem. Biophys. Res. Commun. 140:874-880(1986).  
RN [12]  
RP SEQUENCE OF 16-47.  
RX MEDLINE: 86186784.  
RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;  
RT "Human brain-derived acidic and basic fibroblast growth factors:  
RT amino terminal sequences and specific mitogenic activities.";  
RL Biochem. Biophys. Res. Commun. 135:541-548(1986).  
RN [13]  
RP SEQUENCE OF 16-49.  
RX MEDLINE: 86275260.  
RA Gautschi P., Frater-Schroeder M., Boehlen P.;  
RT "Partial molecular characterization of endothelial cell mitogens from  
RT human brain: acidic and basic fibroblast growth factors.";  
RL FEBS Lett. 104:203-207(1986).  
RN [14]  
RP X-RAY CRYSTALLOGRAPHY (2.0 ANGSTROMS).  
RX MEDLINE: 9194129.  
RA Blaber M., Disalvo J., Thomas K.A.;  
RT "X-ray crystal structure of human acidic fibroblast growth factor.";  
RL Biochemistry 35:2086-2094(1996).  
RN [15]  
RP STRUCTURE BY NMR OF 24-155.  
RX MEDLINE: 94358885.  
RA Pineda-Lucena A., Gimenez M.A., Nieto J.L., Santoro J., Rico M.,  
RA Gimenez-Gallego G.;  
RT "1H-NMR assignment and solution structure of human acidic fibroblast  
RT growth factor activated by inositol hexasulfate.";  
RL J. Mol. Biol. 242:81-98(1994).  
RN [16]  
RP STRUCTURE BY NMR OF 24-155.  
RX MEDLINE: 97107535.  
RA Pineda-Lucena A., Gimenez M.A., Lozano R.M., Nieto J.L., Santoro J.,  
RA Rico M., Gimenez-Gallego G.;  
RT "Three-dimensional structure of acidic fibroblast growth factor in  
RT solution: effects of binding to a heparin functional analog.";  
RL J. Mol. Biol. 264:162-178(1996).  
RN [17]  
RP STRUCTURE BY NMR OF 25-155.  
RX MEDLINE: 98387896.  
RA Lozano R.M., Gimenez M., Santoro J., Rico M., Gimenez-Gallego G.;  
RT "Solution structure of acidic fibroblast growth factor bound to 1,3,  
RT 2-naphthalenesulfonate: a minimal model for the anti-tumoral  
RT action of suramin and suradistas.";  
RL J. Mol. Biol. 281:899-915(1998).  
RN [18]  
RP FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -1- SUBUNIT: MONOMER.  
CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY  
CC THAN DOES BEGF.  
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
CC -----  
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CC -----  
DR EMBL: M13361; AAA79245.1;  
DR EMBL: X51943; CAA36206.1;  
DR EMBL: M30492; AAA52446.1;  
DR EMBL: M30490; AAA52446.1; JOINED.  
DR EMBL: M30491; AAA52446.1; JOINED.  
DR EMBL: M60515; AAA51672.1;  
DR EMBL: M60516; AAA51673.1;  
DR EMBL: M23087; AAA52638.1;  
DR EMBL: M23086; AAA52638.1; JOINED.  
DR EMBL: S67291; AAB29057.1;  
DR EMBL: X65778; CAA46661.1;  
DR PIR: A23553; A23553.  
DR PIR: A24243; A24243.  
DR PIR: A24301; A24301.  
DR PIR: A24662; A24662.  
DR PIR: A24820; A24820.  
DR PIR: A26386; A26386.  
DR PIR: A33665; A33665.  
DR PIR: S18217; S18217.  
DR PDB: 2AFG; 15-OCT-95.  
DR PDB: 1AXM; 22-APR-98.  
DR PDB: 2AXM; 22-APR-98.  
DR PDB: 1RML; 11-NOV-98.  
DR MIM: 131220;  
DR PFAM: PF00167; FGF; 1.  
DR PRINTS: PR00262; ILLHGF.  
DR PRINTS: PR00263; HGFEGF.  
DR PROSITE: PS00247; HGF\_FGF; 1.  
KW Growth factor; Mitogen; Vascularization; Heparin-binding; Acetylation;  
3D-structure.  
FT PROPEP 1 15  
FT CHAIN 16 155  
FT MOD\_RES 2 2  
FT BINDING 24 28  
FT BINDING 113 116  
FT SEQUENCE 155 AA; 17460 MW; F586E8BFB09F1580 CRC64;  
SQ

Query Match 61.8%; Score 984; DB 1; Length 155;  
Best Local Similarity 99.3%; Pred. No. 2.66e-209;  
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 21 GNYKPKLLYCSNGGHFLRILPDGTVGTRSDQHIQOLSAESVGEVYIKSTETGOYL 80  
:|||||  
Qy 87 ANYKPKLLYCSNGGHFLRILPDGTVGTRSDQHIQOLSAESVGEVYIKSTETGOYL 146  
:|||||  
Db 81 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 140  
:|||||  
Qy 147 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 206  
:|||||  
Db 141 GOKAILFLPLPVSSD 155  
:|||||  
Qy 207 GOKAILFLPLPVSSD 221  
:|||||

RESULT 2 STANDARD; PRT; 155 AA.  
ID FGF1\_MOUSE  
PI0935;  
01-JUL-1989 (Rel. 11, Created)  
01-JUL-1989 (Rel. 11, Last sequence update)  
15-JUL-1999 (Rel. 38, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST  
DE GROWTH FACTOR) (AFGF).  
GN FGF1 OR FGF-1 OR FGFA.  
OS Mus musculus (Mouse), and Rattus norvegicus (Rat).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.  
RN [1]  
RP SEQUENCE FROM N.A.  
RC SPECIES=RAT;  
RX MEDLINE; 89240051.  
RA Godrich S., Yan G.C., Bahrenburg K., Mansson P.E.;  
RT "The nucleotide sequence of rat heparin binding growth factor 1  
RL (HBGF-1).";  
RN Nucleic Acids Res. 17:2867-2867(1989).  
[2]  
RP SEQUENCE FROM N.A.  
RC SPECIES=MOUSE;  
RX MEDLINE; 90201563.  
RA Hebert J.M., Basilico C., Goldfarb M., Haub O., Martin G.R.;  
RT "Isolation of cDNAs encoding four mouse FGF family members and  
RL characterization of their expression patterns during embryogenesis.";  
RN Dev. Biol. 138:454-463(1990).  
[3]  
RP SEQUENCE FROM N.A.  
RC SPECIES=MOUSE;  
RX MEDLINE; 97128312.  
RA Madai F., Hackshaw K.V., Chiu I.M.;  
RT "Cloning and characterization of the mouse Fgf-1 gene.";  
RN Gene 179:231-236(1996).  
[4]  
RP SEQUENCE FROM N.A.  
RC SPECIES=MOUSE; STRAIN=BALB/C;  
RX MEDLINE; 97094746.  
RA Alam K.Y., Frostholt A., Hackshaw K.V., Evans J.E., Rotter A.,  
RA Chiu I.M.;  
RT "Characterization of the 1B promoter of fibroblast growth factor 1  
RL and its expression in the adult and developing mouse brain.";  
RN J. Biol. Chem. 271:30263-30271(1996).  
CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -1- SUBUNIT: MONOMER.  
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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or send an email to [license@isb-sib.ch](mailto:license@isb-sib.ch)).  
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CC ENBL; X14232; CAA32448.1; -  
DR ENBL; M30641; AAA37618.1; -  
DR ENBL; U36459; AAC52969.1; -  
DR ENBL; U36457; AAC52969.1; JOINED.  
DR ENBL; U36458; AAC52969.1; JOINED.  
DR ENBL; U67610; AAC52907.1; -  
DR PIR; S04147; S04147.  
DR PIR; D37360; D37360.  
DR HSP; P05230; ZAXM.  
DR MGD; MGI:95515; FGF1.  
DR PFAM; PF00167; FGF; 1.  
DR PRINTS; PR00262; IL1HBGF.  
DR PRINTS; PR00263; HBGEFG.  
DR PROSITE; PS00247; HBGF\_FGF; 1.  
KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
FT PROPEP 1 15  
FT CHAIN 16 155 HEPARIN-BINDING GROWTH FACTOR 1.  
FT BINDING 24 28 HEPARIN (POTENTIAL).  
FT BINDING 113 116 HEPARIN (POTENTIAL).  
SQ SEQUENCE 155 AA; 17418 MW; 8880E4FF0FBA4161 CRC64;  
Query Match 61.0%; Score 972; DB 1; Length 155;  
Best Local Similarity 95.0%; Pred. No. 2.88e-206;  
Matches 132; Conservative 4; Mismatches 2; Indels 1; Gaps 1;  
Db 18 LPL-GNYKPKLLYCSNGGHFLRILPDGTVGTRSDQHIQOLSAESVGEVYIKSTET 76  
:|||||  
Qy 83 VPLDANYKPKLLYCSNGGHFLRILPDGTVGTRSDQHIQOLSAESVGEVYIKSTET 142  
:|||||  
Db 77 GOYLANDTEGLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRG 136  
:|||||  
Qy 143 GOYLANDTEGLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRG 202  
:|||||  
Db 137 RTHYGQKAILFLPLPVSSD 155  
:|||||  
Qy 203 RTHYGQKAILFLPLPVSSD 221  
:|||||

RESULT 3 STANDARD; PRT; 155 AA.  
ID FGF1\_MESAU  
AC P34004;  
DT 01-FEB-1994 (Rel. 28, Created)  
DT 01-FEB-1994 (Rel. 28, Last sequence update)  
DT 15-JUL-1999 (Rel. 38, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST  
DE GROWTH FACTOR) (AFGF).  
GN FGF1 OR FGF-1.  
OS Mesocricetus auratus (Golden hamster).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Cricetinae;  
OC Mesocricetus.  
RN [1]  
RP SEQUENCE FROM N.A.  
RX MEDLINE; 90270291.  
RA Hall J.A., Harris M.A., Malark M., Mansson P.E., Zhou H., Harris S.E.;  
RT "Characterization of the hamster Ddt-1 cell afGF/HBGF-1 gene and cDNA  
RL and its modulation by steroids.";  
RN J. Cell. Biochem. 43:17-26(1990).  
CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -1- SUBUNIT: MONOMER.  
CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY  
CC THAN DOES BFGF.  
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
DR PIR; A60721; A60721.  
DR HSP; P05230; ZAXM.  
DR PFAM; PF00167; FGF; 1.  
DR PRINTS; PR00262; IL1HBGF.

DR PRINTS: PR00263; HBGF\_FGF.  
DR PROSITE; PS00247; HBGF\_FGF; 1.  
KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
FT PROPEP 1 15 BY SIMILARITY.  
FT CHAIN 16 155 HEPARIN-BINDING GROWTH FACTOR 1.  
FT BINDING 24 28 HEPARIN (POTENTIAL).  
FT BINDING 113 116 HEPARIN (POTENTIAL).  
SQ SEQUENCE 155 AA; 17403 MW; 41E5EC760E412CC5 CRC64;

Query Match 60.7%; Score 967; DB 1; Length 155;  
Best Local Similarity 97.0%; Pred. No. 5.29e-205;  
Matches 131; Conservative 2; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRILPDGTVDGTRDSQDHIQLQLSAESAGEVYIKSTGTGYL 80  
QY 87 ANYKKPKLLYCSNGGHFLRILPDGTVDGTRDSQDHIQLQLSAESAGEVYIKSTGTGYL 146  
Db 81 AMDTGGLYGSQTPNEECFLERLEENHYNTYTSKKHAENWVGLKKNKSGCKRGPRTHY 140  
QY 147 AMDTGGLYGSQTPNEECFLERLEENHYNTYTSKKHAENWVGLKKNKSGCKRGPRTHY 206  
Db 141 GOKAILFLPLPVSSD 155  
QY 207 GOKAILFLPLPVSSD 221

RESULT 4  
ID FGFL\_PIG STANDARD; PRT; 152 AA.  
AC P20002;  
DT 01-FEB-1991 (Rel. 17, Created)  
DT 01-FEB-1996 (Rel. 33, Last sequence update)  
DT 15-JUL-1999 (Rel. 38, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF) (ALPHA-ENDOTHELIAL CELL GROWTH FACTOR) (FRAGMENT).  
DE TISSUE=HEART;  
GN Sus scrofa (Pig).  
OS Sus scrofa (Pig).  
OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Cetartiodactyla; Suina; Suidae; Sus.  
RN [1]  
RP SEQUENCE FROM N.A.  
RC TISSUE=HEART;  
RX MEDLINE; 92062117.  
RA Schmidt M., Sharma H.S., Schott R.J., Schaper W.;  
RT "Amplification and sequencing of mRNA encoding acidic fibroblast growth factor (afGF) from porcine heart.";  
RL Biochem. Biophys. Res. Commun. 180:853-859(1991).  
RN [2]  
RX SEQUENCE OF 22-41.  
RX MEDLINE; 89231704.  
RA Quinkler W., Maasberg M., Bernotat-Danielowski S., Luethe N.,  
RA Sharma H.S., Schaper W.;  
RT "Isolation of heparin-binding growth factors from bovine, porcine and canine hearts.";  
RL Eur. J. Biochem. 181:67-73(1989).  
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -!- SUBUNIT: MONOMER.  
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY THAN DOES BFGF.  
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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CC EMBL; X60317; CAA42869.1;  
DR

DR PIR; S03954; S03954.  
DR HSSP; P05230; 2AXM.  
DR PFAM; PF00167; FGF; 1.  
DR PROSITE; PS00247; HBGF\_FGF; 1.  
KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
FT PROPEP 1 15  
FT CHAIN 16 >152 HEPARIN-BINDING GROWTH FACTOR 1.  
FT CHAIN 22 >152 ENDOTHELIAL CELL GROWTH FACTOR ALPHA.  
FT BINDING 24 28 HEPARIN (POTENTIAL).  
FT BINDING 113 116 HEPARIN (POTENTIAL).  
FT CONFLICT 31 31 C -> S (IN REF. 2).  
FT CONFLICT 39 39 R -> Y (IN REF. 2).  
FT NON\_TER 152 152  
SQ SEQUENCE 152 AA; 17103 MW; AE853B0A92F9ABF4 CRC64;

Query Match 59.8%; Score 953; DB 1; Length 152;  
Best Local Similarity 97.0%; Pred. No. 1.82e-201;  
Matches 128; Conservative 2; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRILPDGTVDGTRDSQDHIQLQLSAESAGEVYIKSTGTGYL 80  
QY 87 ANYKKPKLLYCSNGGHFLRILPDGTVDGTRDSQDHIQLQLSAESAGEVYIKSTGTGYL 146  
Db 81 AMDTGGLYGSQTPNEECFLERLEENHYNTYTSKKHAENWVGLKKNKSGCKRGPRTHY 140  
QY 147 AMDTGGLYGSQTPNEECFLERLEENHYNTYTSKKHAENWVGLKKNKSGCKRGPRTHY 206  
Db 141 GOKAILFLPLPV 152  
QY 207 GOKAILFLPLPV 218

RESULT 5  
ID FGFL\_BOVIN STANDARD; PRT; 155 AA.  
AC P03968;  
DT 23-OCT-1986 (Rel. 02, Created)  
DT 01-MAR-1989 (Rel. 10, Last sequence update)  
DT 15-JUL-1999 (Rel. 38, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF) (PROSTATROPIN) (ENDOTHELIAL CELL GROWTH FACTOR BETA AND ALPHA CHAINS) (ACIDIC EYE-DERIVED GROWTH FACTOR II) (EDGF II).  
GN FGF1 OR FGF-1 OR FGFA OR HBGF-1 OR AFGF.  
OS Bos taurus (Bovine).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae; Bovidae; Bovinae; Bos.  
RN [1]  
RP SEQUENCE FROM N.A.  
RC TISSUE=RETINA;  
RX MEDLINE; 89083506.  
RA Halley C., Courtois Y., Laurent M.;  
RT "Nucleotide sequence of bovine acidic fibroblast growth factor cDNA.";  
RL Nucleic Acids Res. 16:10913-10913(1988).  
RN [2]  
RP SEQUENCE FROM N.A.  
RC TISSUE=RETINA;  
RX MEDLINE; 89078619.  
RA Alterio J., Halley C., Brou C., Soussi T., Courtois Y., Laurent M.;  
RT "Characterization of a bovine acidic FGF cDNA clone and its expression in brain and retina.";  
RL FEBS Lett. 242:41-46(1988).  
RN [3]  
RP SEQUENCE OF 2-155.  
RX MEDLINE; 87016918.  
RA Burgess W.H., Mehlman T., Marshak D.R., Fraser B.A., Maciag T.;  
RT "Structural evidence that endothelial cell growth factor beta is the precursor of both endothelial cell growth factor alpha and acidic fibroblast growth factor.";  
RL proc. Natl. Acad. Sci. U.S.A. 83:7216-7220(1986).  
RN [4]  
RP SEQUENCE OF 2-155.  
RX MEDLINE; 87026586.







FT DOMAIN 171 198 CYTOPLASMIC (POTENTIAL).  
FT CARBOHYD 39 39 O-LINKED (GLYCOSAMINOGLYCAN) (POTENTIAL).  
FT CARBOHYD 61 61 O-LINKED (GLYCOSAMINOGLYCAN) (POTENTIAL).  
FT CARBOHYD 63 63 O-LINKED (GLYCOSAMINOGLYCAN) (POTENTIAL).  
FT CONFLICT 12 12 F -> L (IN REF. 1).  
SQ SEQUENCE 198 AA; 21641 MW; 8229AA2733F77A10 CRC64;  
Query Match 38.2%; Score 608; DB 1; Length 198;  
Best Local Similarity 97.7%; Pred. No. 2.38e-115;  
Matches 86; Conservative 1; Mismatches 1; Indels 0; Gaps 0;  
Db 1 MAPARFALLFFVGGVAISRETEVIDQDLLEGYFSGALPDDDEYVGPQGESDDFEL 60  
QY 1 MAPARFALLFFVGGVAISRETEVIDQDLLEGYFSGALPDDDEYVGPQGESDDFEL 60  
Db 61 SGSGLDLDLSDSMIGPEVHPLVPLDNH 88  
QY 61 SGSGLDLDLSDSMIGPEVHPLVPLDNH 88  
RESULT 8  
FGF2 CHICK STANDARD; PRT; 158 AA.  
AC P48800;  
DT 01-FEB-1996 (Rel. 33, Created)  
DT 01-FEB-1996 (Rel. 33, Last sequence update)  
DT 01-FEB-1996 (Rel. 33, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF).  
GN FGF2 OR FGF-2.  
OS Gallus gallus (Chicken).  
OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;  
OC Archosauria; Aves; Neognathae; Galliformes; Phasianidae; Phasianinae;  
OC Gallus.  
RN [1]  
RP SEQUENCE FROM N.A.  
RX MEDLINE; 93246053.  
RA Borja A.Z., Zeller R., Meijers C.;  
RT "Expression of alternatively spliced bFGF first coding exons and intronless mRNAs during chicken embryogenesis.";  
RL Dev. Biol. 157:110-118 (1993).  
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -!- SUBUNIT: MONOMER.  
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES AFGF.  
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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CC EMBL; M95707; AAA48617.1;  
CC HSP; P09038; IBFF.  
CC PFAM; PF00167; FGF; 1.  
CC PRINTS; PR00262; IL1HBGF.  
CC PRINTS; PR00263; HBGF.FGF.  
CC PROSITE; PS00247; HBGF\_FGF; 1.  
KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
FT PROPEP 1 12 BY SIMILARITY.  
FT CHAIN 13 158 HEPARIN-BINDING GROWTH FACTOR 2.  
FT BINDING 30 34 HEPARIN (POTENTIAL).  
FT BINDING 119 122 HEPARIN (POTENTIAL).  
SQ SEQUENCE 158 AA; 17374 MW; 769B684C17F1816 CRC64;  
Query Match 32.8%; Score 522; DB 1; Length 158;  
Best Local Similarity 54.5%; Pred. No. 2.34e-94;  
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

Db 27 GHFKDPKRLYCKNGGFFLRINPDGRVDGVREKSDPHIKLQAEERGVVSIKGVSANREL 86  
QY 87 ANYKPKLLYCSNGGHFLRLPLDGTVDGTRDSQHQIQLQLSAESVGEVYIKSTETGOVL 146  
Db 87 AKEDGRLLALKCAETEEFFERLESNNYNTYRSKYS--WYVALKRTGQYKPGKTPG 144  
QY 147 AMDTDGLLYGSQTPNEECLEFLERLEENHYNTYISKHAEKNFVGLKKNKSGCKRGPRTY 206  
Db 145 GOKAILFLPMSAKS 158  
QY 207 GOKAILFLPLPVSS 220  
RESULT 9  
ID FGF2 SHEEP STANDARD; PRT; 155 AA.  
AC P20003;  
DT 01-FEB-1991 (Rel. 17, Created)  
DT 01-FEB-1996 (Rel. 33, Last sequence update)  
DT 01-FEB-1996 (Rel. 33, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF) (PROSTATROPIN).  
GN FGF2 OR FGF-2.  
OS Ovis aries (Sheep).  
OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;  
OC Bovidae; Caprinae; Ovis.  
RN [1]  
RP SEQUENCE FROM N.A.  
RA Sutton R., Ward W.G., Raphael K.A., Cam G.R.;  
RL Submitted (SEP-1994) to the EMBL/GenBank/DBJ databases.  
RN [2]  
RP SEQUENCE OF 9-155.  
RX MEDLINE; 88055577.  
RA Simpson R.J., Moritz R.L., Lloyd C.J., Fabri L.J., Nice E.C.;  
RA Rubira M.R., Burgess A.W.;  
RT "Primary structure of ovine pituitary basic fibroblast growth factor.";  
RL FEBS Lett. 224:128-132 (1987).  
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -!- SUBUNIT: MONOMER.  
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES AFGF.  
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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CC EMBL; L36136; AAA31519.1;  
CC PIR; S00185; S00185.  
CC HSP; P09038; IBFF.  
CC PFAM; PF00167; FGF; 1.  
CC PRINTS; PR00262; IL1HBGF.  
CC PRINTS; PR00263; HBGF.FGF.  
CC PROSITE; PS00247; HBGF\_FGF; 1.  
KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
FT PROPEP 1 9  
FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.  
FT SITE 45 48 CELL ATTACHMENT SITE (POTENTIAL).  
FT SITE 87 90 CELL ATTACHMENT SITE (POTENTIAL).  
FT BINDING 27 31 HEPARIN (POTENTIAL).  
FT BINDING 116 119 HEPARIN (POTENTIAL).  
SQ SEQUENCE 155 AA; 17280 MW; B5F2364BA610606D CRC64;  
Query Match 32.4%; Score 516; DB 1; Length 155;

Best Local Similarity 55.2%; Pred. No. 6.64e-93;  
Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;

Db 24 GHFKDRLKNGGFFLRTHPDGRVGRKSDPHKLOLOAEERGVSIGVCANRYL 83  
QY 87 ANYKKPLLYCSNGGHEFLRLPDGTVDGTRSDQHLQLSAESVGEVYKSTETQYLL 146  
Db 84 AMKEDGRLLASKVTDCEFFERLESNNYTYRSKYS--SWYVALKRTQYKLGPKTGP 141  
QY 147 AMDTDGLLYGSGTNEECLEFLERLEENHYNTYISKHAENWFVGLKNGSKCRGPRTY 206  
Db 142 GKAILFLPMSAKS 155  
QY 207 GKAILFLPLVSS 220

RESULT 10  
ID FGF2\_BOVIN STANDARD; PRT; 155 AA.  
AC P03969;  
23-OCT-1986 (Rel. 02, Created)  
01-FEB-1996 (Rel. 02, Last sequence update)  
01-FEB-1996 (Rel. 33, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST  
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN) [CONTAINS: KIDNEY-DERIVED GROWTH  
DE FACTOR].  
GN FGF2 OR FGF-2.  
OS Bos taurus (Bovine).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovoides;  
OC Bovidae; Bovinae; Bos.  
RN [1]  
RP SEQUENCE FROM N.A.  
RX MEDLINE; 86261806.  
RA Abraham J.A., Whang J.L., Tumolo A., Fiddes J.C.;  
RA Hierild K.A., Gospodarowicz D., Fiddes J.C.;  
RT "Nucleotide sequence of a bovine clone encoding the angiogenic  
RT protein, basic fibroblast growth factor.";  
RL Science 233:545-548(1986).  
RN [2]  
RP SEQUENCE FROM N.A.  
RX MEDLINE; 87217066.  
RA Abraham J.A., Whang J.L., Tumolo A., Fiddes J.C.;  
RA "Human basic fibroblast growth factor: nucleotide sequence, genomic  
RT organization, and expression in mammalian cells.";  
RL Cold Spring Harb. Symp. Quant. Biol. 51:657-668(1986).  
RN [3]  
RP SEQUENCE OF 10-155.  
RX MEDLINE; 86016731.  
RA Esch F., Baird A., Ling N., Ueno N., Hill F., Denoroy L., Klepper R.,  
RA Gospodarowicz D., Boehlen P., Guillemin R.;  
RT "Primary structure of bovine pituitary basic fibroblast growth factor  
RT (FGF) and comparison with the amino-terminal sequence of bovine brain  
RT acidic FGF.";  
RL Proc. Natl. Acad. Sci. U.S.A. 82:6507-6511(1985).  
RN [4]  
RP SEQUENCE OF 1-9.  
RX MEDLINE; 86295737.  
RA Ueno N., Baird A., Esch F., Ling N., Guillemin R.;  
RA "Isolation of an amino terminal extended form of basic fibroblast  
RT growth factor.";  
RL Biochem. Biophys. Res. Commun. 138:580-588(1986).  
RN [5]  
RP SEQUENCE OF 25-41.  
RX TISSUE-KIDNEY;  
RX MEDLINE; 86095426.  
RA Baird A., Esch F., Boehlen P., Ling N., Gospodarowicz D.;  
RA "Isolation and partial characterization of an endothelial cell growth  
RT factor from the bovine kidney: homology with basic fibroblast growth  
RT factor.";  
RL Regul. Pept. 12:201-213(1985).  
RN [6]  
RP SEQUENCE OF 21-40.  
RX TISSUE-KIDNEY;

RX MEDLINE; 87119165.  
RA Ueno N., Baird A., Esch F., Shimasaki S., Ling N., Guillemin R.;  
RT "Purification and partial characterization of a mitogenic factor from  
RT bovine liver: structural homology with basic fibroblast growth  
RT factor.";  
RL Regul. Pept. 16:135-145(1986).  
RN [7]  
RP X-RAY CRYSTALLOGRAPHY (3.0 ANGSTROMS).  
RX MEDLINE; 91095983.  
RA Zhu X., Komiyama H., Chirino A., Faham S., Fox G.M., Arakawa T.,  
RA Hsu B.T., Rees D.C.;  
RT "Three-dimensional structures of acidic and basic fibroblast growth  
RT factors.";  
RL Science 251:90-93(1991).  
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -!- SUBUNIT: MONOMER.  
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES  
CC AFGF.  
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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CC -----  
CC EMBL; M13440; AAA30518.1;  
DR PIR; A24663; GKBOB.  
DR PIR; A24819; A24819.  
DR PIR; A32878; A32878.  
DR PDB; 1BAS; 31-OCT-93.  
DR PFAM; PF00167; FGF; 1.  
DR PRINTS; PR00263; IL1HBGF.  
DR PRINTS; PR00263; HBGFEGF.  
DR PROSITE; PS00247; HBGF\_FGF; 1.  
KW Growth factor; Mitogen; Vascularization; Heparin-binding;  
KW 3D-structure.  
FT PROPEP 1  
FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.  
FT CHAIN 25 155 KIDNEY-DERIVED GROWTH FACTOR.  
FT SITE 46 48 CELL ATTACHMENT SITE (POTENTIAL).  
FT SITE 88 90 CELL ATTACHMENT SITE (POTENTIAL).  
FT BINDING 27 31 HEPARIN (POTENTIAL).  
FT BINDING 116 119 HEPARIN (POTENTIAL).  
FT STRAND 30 34  
FT TURN 35 38  
FT STRAND 39 43  
FT TURN 45 46  
FT STRAND 49 52  
FT TURN 55 56  
FT HELIX 58 60  
FT STRAND 62 68  
FT TURN 69 70  
FT STRAND 71 76  
FT TURN 77 80  
FT STRAND 81 85  
FT TURN 87 88  
FT STRAND 91 94  
FT HELIX 99 101  
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FT STRAND 113 117  
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FT STRAND 124 124  
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FT STRAND 133 133  
FT HELIX 136 138

FT TURN 141 142  
 FT HELIX 144 146  
 FT STRAND 148 151  
 SQ SEQUENCE 155 AA; BE6CE70FA6107129 CRC64;  
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 Best Local Similarity 55.2%; Pred. No. 6.64e-93;  
 Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;  
 Db 24 GHKDPKRLKNGGFLRLTHPDGRVDGVRKSDPHIKLOLQAEERGVSIVKVCANRYL 83  
 QY 87 ANYKPKLLKCSNGGHEFLRLPDGTVDGRSDQHLOLSASBSGVKSTETGQYL 146  
 Db 84 AKKEDGRLKSLKCTVDECFEERLESNNYTYRSRKY--SWYVALRGTQYKLGPKTGP 141  
 QY 147 AMDTDGLLYGQTPNECLFLERLEENHNTYISKHAENKFWGLAKNGSKRGPRTHY 206  
 Db 142 GQKAILFLPMSAKS 155  
 207 GQKAILFLPLPVSS 220  
 RESULT 11  
 ID FGF2\_HUMAN STANDARD; PRT; 155 AA.  
 AC P09038;  
 DT 01-NOV-1988 (Rel. 09, Created)  
 DT 01-NOV-1988 (Rel. 09, Last sequence update)  
 DT 01-NOV-1997 (Rel. 35, Last annotation update)  
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST  
 DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).  
 GN FGF2 OR FGF8.  
 OS Homo sapiens (Human).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 87053817.  
 RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Friedman J.,  
 RA Gospodarowicz D., Fiddes J.C.;  
 RT "Human basic fibroblast growth factor: nucleotide sequence and  
 RT genomic organization.";  
 RL EMBO J. 5:2523-2528(1986).  
 RN [2]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 87217066.  
 RA Abraham J.A., Whang J.L., Tumolo A., Fiddes J.C.;  
 RT "Human basic fibroblast growth factor: nucleotide sequence, genomic  
 RT organization, and expression in mammalian cells.";  
 RL Cold Spring Harb. Symp. Quant. Biol. 51:657-668(1986).  
 RN [3]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 87213238.  
 RA Sommer A., Brewer M.T., Thompson R.C., Moscatelli D., Presta M.,  
 RA Rifkin D.B.;  
 RT "A form of human basic fibroblast growth factor with an extended  
 RT amino terminus.";  
 RL Biochem. Biophys. Res. Commun. 144:543-550(1987).  
 RN [4]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 87162468.  
 RA Kurokawa T., Sasada R., Iwane M., Igarashi K.;  
 RT "Cloning and expression of cDNA encoding human basic fibroblast  
 RT growth factor.";  
 RL FEBS Lett. 213:189-194(1987).  
 RN [5]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 89184522.  
 RA Pratts H., Kaghad M., Pratts A.C., Klagsbrun M., Lelias J.M.,  
 RA Liauzun P., Chalou P., Tauber J.P., Amalric F., Smith J.A.,  
 RA Caput D.;  
 RT "High molecular mass forms of basic fibroblast growth factor are  
 RT initiated by alternative CUG codons.";  
 RL Proc. Natl. Acad. Sci. U.S.A. 86:1836-1840(1989).  
 RL

RN [6]  
 RP SEQUENCE OF 10-35.  
 RX MEDLINE; 86275260.  
 RA Gautschi P., Frater-Schroeder M., Boehlen P.;  
 RT "Partial molecular characterization of endothelial cell mitogens from  
 RT human brain: acidic and basic fibroblast growth factors.";  
 RL FEBS Lett. 204:203-207(1986).  
 RN [7]  
 RP SEQUENCE OF 10-39.  
 RX MEDLINE; 86186784.  
 RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;  
 RT "Human brain-derived acidic and basic fibroblast growth factors:  
 RT amino terminal sequences and specific mitogenic activities.";  
 RL Biochem. Biophys. Res. Commun. 135:541-548(1986).  
 RN [8]  
 RP SEQUENCE OF 2-22.  
 RX MEDLINE; 87156886.  
 RA Story M.T., Esch F., Shimasaki S., Sasse J., Jacobs S.C., Lawson R.K.;  
 RT "Amino-terminal sequence of a large form of basic fibroblast growth  
 RT factor isolated from human benign prostatic hyperplastic tissue.";  
 RL Biochem. Biophys. Res. Commun. 142:702-709(1987).  
 RN [9]  
 RP X-RAY CRYSTALLOGRAPHY (2.2 ANGSTROMS).  
 RX MEDLINE; 91195367.  
 RA Eriksson A.E., Cousins L.S., Weaver L.H., Matthews B.W.;  
 RT "Three-dimensional structure of human basic fibroblast growth  
 RT factor.";  
 RL Proc. Natl. Acad. Sci. U.S.A. 88:3441-3445(1991).  
 RN [10]  
 RP X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).  
 RX MEDLINE; 94004464.  
 RA Eriksson A.E., Cousins L.S., Matthews B.W.;  
 RT "Refinement of the structure of human basic fibroblast growth factor  
 RT at 1.6-A resolution and analysis of presumed heparin binding sites by  
 RT selenate substitution.";  
 RL Protein Sci. 2:1274-1284(1993).  
 RN [11]  
 RP X-RAY CRYSTALLOGRAPHY (1.8 ANGSTROMS).  
 RX MEDLINE; 91195368.  
 RA Zhang J., Cousins L.S., Barr P.J., Sprang S.R.;  
 RT "Three-dimensional structure of human basic fibroblast growth factor,  
 RT a structural homolog of interleukin 1 beta.";  
 RL Proc. Natl. Acad. Sci. U.S.A. 88:3446-3451(1991).  
 RN [12]  
 RP X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).  
 RX MEDLINE; 92121151.  
 RA Ago H., Kitagawa Y., Fujishima A., Matsuura Y., Katsube Y.;  
 RT "Crystal structure of basic fibroblast growth factor at 1.6-A  
 RT resolution.";  
 RL J. Biochem. 110:360-363(1991).  
 RN [13]  
 RP X-RAY CRYSTALLOGRAPHY (2.8 ANGSTROMS).  
 RX MEDLINE; 91095983.  
 RA Zhu X., Komiya H., Chirino A., Faham S., Fox G.M., Arakawa T.,  
 RA Hsu B.T., Rees D.C.;  
 RT "Three-dimensional structures of acidic and basic fibroblast growth  
 RT factors.";  
 RL Science 251:90-93(1991).  
 RN [14]  
 RP STRUCTURE BY NMR.  
 RX MEDLINE; 97040521.  
 RA Moy F.J., Seddon A.P., Boehlen P., Powers R.;  
 RT "High-resolution solution structure of basic fibroblast growth factor  
 RT determined by multidimensional heteronuclear magnetic resonance  
 RT spectroscopy.";  
 RL Biochemistry 35:13552-13561(1996).  
 RL CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
 CC VIRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
 CC -!- SUBUNIT: MONOMER.  
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES  
 CC AFGF.



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CC      ENBL; M22427; AAA1210.1; -
DR      CC      ENBL; X07285; CAA30265.1; -
DR      ENBL; U78079; AAC53225.1; -
DR      ENBL; X61697; CAA43863.1; -
DR      PIR; S00876; S00876.
DR      PIR; A31674; A31674.
DR      HSP; P05038; IBFF.
DR      PFAM; PF00187; FGF; 1.
DR      PRINTS; PR00262; ILIHGFG.
DR      PRINTS; PR00263; HBGFFGFG.
DR      PROSITE; PS00247; HBGF.FGF; 1.
KW      Growth factor; Mitogen; Vascularization; Heparin-binding.
PROPEP      1
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BINDING      115 118      HEPARIN (POTENTIAL).
SQ      SEQUENCE 154 AA; 117139 MW; 1A0F14FF423D8403 CRC64;
SQ

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DT	01-APR-1990 (Rel. 14, Created)
DT	01-APR-1990 (Rel. 14, Last sequence update)
DT	01-FEB-1996 (Rel. 33, Last annotation update)
DT	HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BEGF) (PROSTATROPIN).
GN	FGF2 OR FGF-2.
OS	Mus musculus (Mouse).
OC	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC	Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
RN	[1]
RP	SEQUENCE FROM N.A.
RX	MEDLINE; 90201563.
RA	Hebert J.M., Basilico C., Goldfarb M., Haub O., Martin G.R. ;
RT	"Isolation of cDNAs encoding four mouse FGF family members and characterization of their expression patterns during embryogenesis.";
RL	Dev. Biol. 138:454-463(1990).
CC	-!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC	-!- SUBUNIT: MONOMER.
CC	-!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES AFGE.
CC	-!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.

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CC -----
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CC ENBL; M30644; AAA37621.1; -.
DR DR
DR PIR; C37360; C37360.
DR DR
DR HSPP; P09038; IBFF.
DR DR
DR MGD; MGI:95516; FGF2.
DR DR
DR PFAM; PF00167; FGF; 1.
DR DR
DR PRINTS; PR00262; ILIHGFG.
DR DR
DR PRINTS; PR00263; HBGFFGF.
DR DR
DR PROSITE; PS00247; HBGF.FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1
FT CHAIN 10 154
FT BINDING 26 30
FT BINDING 115 118
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SQ  SEQUENCE  154 AA;  17153 MW;  689F677416274388 CRC64;

Query Match      31.9%;  Score 508;  DB 1;  Length 154;
Best Local Similarity 54.5%;  Pred. NO. 5.73e-91;
Matches 73;  Conservative 23;  Mismatches 36;  Indels 2;  Gaps 1;

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Db      83  AMKEDGRLAASKVCTECFEFLERESNNYNTYISRRKYS--SWYVLAARTGYKLGSKTGP  140
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Qy      147  AMDTDGLLYQSQPNESCLERLEENHYNTYISKKHAENKWFVGLKKNCKSGKRGPRTHY  206
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Db      141  GQKAILFLPWSAKS 154
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Qy      207  GQKAILFLPVPSS 220
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RESULT 14  
 ID FGF2\_MONDO STANDARD; PRT; 156 AA.  
 AC P48798;  
 DT 01-FEB-1996 (Rel. 33, Created)  
 DT 01-FEB-1996 (Rel. 33, Last sequence update)  
 DT 01-NOV-1997 (Rel. 35, Last annotation update)  
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST  
 DE GROWTH FACTOR) (BGF) (PROSTATROPIN).  
 GN FGF2.  
 OS Monodelphis domestica (Short-tailed grey opossum).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
 OC Mammalia; Metatheria; Didelphimorphia; Didelphidae; Monodelphis.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RC SEQUENCE-EYE;  
 RC TISSUE-EYE;  
 RX MEDLINE; 94296558.  
 RA Kuselitt D.F., Sabourin C.L.K., Sherburn T.E., Ley R.D.;  
 RT "Characterization of cDNA encoding basic fibroblast growth factor of  
 RT the marsupial Monodelphis domestica.";  
 RL DNA Cell Biol. 13:549-554(1994).  
 CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
 CC -1- SUBUNIT: MONOMER.  
 CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES  
 CC AFGE.  
 CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
 CC -----  
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Job time : 13 secs.



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MPSrch\_pp protein - protein database search, using Smith-Waterman algorithm  
on: Tue Aug 29 15:38:14 2000; MasPar time 19.48 Seconds  
786.734 Million cell updates/sec  
Tabular output not generated.

Title: >US-09-121-017B-1  
Description: (1-221) from US09121017B.pep  
Perfect Score: 1593  
Sequence: 1 MAPARLALLFFVGGVAES.....PRTHYGQKAILFLPLPVSSD 221

Scoring table: PAM 150  
Gap 11

Searched: 225878 seqs, 69334122 residues

Post-processing: Minimum Match 0%  
Listing first 45 summaries

Database: ~~spiremb12~~  
1:sp\_archaea 2:sp\_bacteria 3:sp\_fungi 4:sp\_human  
5:sp\_invertebrate 6:sp\_mammal 7:sp\_mhc 8:sp\_organelle  
9:sp\_phase 10:sp\_plant 11:sp\_rodent 12:sp\_unclassified  
13:sp\_vertebrate 14:sp\_virus

Statistics: Mean 44.785; Variance 70.998; scale 0.631

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES				Pred. No.	
Result No.	Score	Query Match	Description	ID	
1	511	32.1	BASIC FIBROBLAST GROWT	077767	2.28e-95
2	509	32.0	21 KD BASIC FIBROBLAST	P78443	7.23e-95
3	382	24.0	BASIC FGF (FRAGMENT)	10113	1.85e-63
4	359	22.5	RYUDOCAN CORE PROTEIN	035988	6.87e-58
5	346	21.7	FIBROBLAST GROWTH FACT	007659	9.21e-55
6	313	19.6	BASIC FIBROBLAST GROWT	060487	6.68e-47
7	302	19.0	KERATINOCYTE GROWTH FA	P79150	2.62e-44
8	301	18.9	FIBROBLAST GROWTH FACT	042407	4.49e-44
9	274	17.2	FHF-4B.	089096	8.79e-38
10	270	16.9	FIBROBLAST GROWTH FACT	054837	7.36e-37
11	264	16.6	ACIDIC FIBROBLAST GROW	016089	1.76e-35
12	265	16.6	ACIDIC FIBROBLAST GROW	016588	1.04e-35
13	260	16.3	POTATIVE FIBROBLAST GR	Q9YH31	1.46e-34
14	257	16.1	FIBROBLAST GROWTH FACT	09W6A1	7.05e-34
15	251	15.8	FIBROBLAST GROWTH FACT	099517	1.64e-32
16	250	15.7	FIBROBLAST GROWTH FACT	09YGD8	2.76e-32
17	248	15.6	FIBROBLAST GROWTH FACT	095830	7.86e-32
18	248	15.6	FIBROBLAST GROWTH FACT	Q9W6A2	7.86e-32
19	236	14.8	FIBROBLAST GROWTH FACT	P79925	3.98e-29
20	226	14.2	LET-756 PROTEIN.	076831	6.79e-27

21	225	14.1	74	6	077561	KERATINOCYTE GROWTH FA	1.13e-26
22	223	14.0	204	13	Q90696	FIBROBLAST GROWTH FACT	3.14e-26
23	222	13.9	210	13	O57341	FIBROBLAST GROWTH FACT	5.22e-26
24	217	13.6	770	5	P91672	FGF HOMOLOG	6.61e-25
25	213	13.4	244	4	Q14915	FIBROBLAST GROWTH FACT	4.99e-24
26	209	13.1	210	13	Q42278	FIBROBLAST GROWTH FACT	3.73e-23
27	207	13.0	129	4	O60371	R33683_2.	1.02e-22
28	199	12.5	285	14	Q9YMH2	FIBROBLAST GROWTH FACT	5.45e-21
29	198	12.4	182	14	O92401	FGF-ACMNPV ORF32.	8.94e-21
30	187	11.7	216	4	O95750	FGF-19	1.97e-18
31	183	11.5	73	6	O97573	FIBROBLAST GROWTH FACT	1.37e-17
32	181	11.4	114	4	Q16443	BASIC FIBROBLAST GROWT	3.61e-17
33	181	11.4	114	4	O00527	BASIC FIBROBLAST GROWT	3.61e-17
34	137	9.9	78	11	O35340	FIBROBLAST GROWTH FACT	2.95e-12
35	118	7.4	822	1	O27154	CONSERVED PROTEIN.	6.75e-05
36	116	7.3	82	6	O62682	FIBROBLAST GROWTH FACT	1.51e-04
37	112	7.0	86	13	P79885	FIBROBLAST GROWTH FACT	7.38e-04
38	108	6.8	375	11	O88701	NUCLEOSOME ASSEMBLY PR	3.49e-03
39	102	6.4	243	14	O73554	HYPOTHETICAL 27.5 KD P	3.36e-02
40	101	6.3	211	1	O9YEE7	211AA LONG HYPOTHETICA	4.86e-02
41	101	6.3	481	1	O74081	481AA LONG HYPOTHETICA	4.86e-02
42	97	6.1	731	1	O59651	PEROXIDASE/CATALASE (E	2.07e-01
43	96	6.0	352	8	Q37406	MITOCHONDRION ASPERGIL	2.96e-01
44	96	6.0	455	2	O51138	REPLICATIVE DNA HELICA	2.96e-01
45	96	6.0	3443	14	O11979	POLYPROTEIN.	2.96e-01

ALIGNMENTS

RESULT 1		PRELIMINARY;		PRT;		130 AA.	
ID	077767	AC	077767	DT	01-NOV-1998	(TrEMBLrel. 08, Created)	
DT	01-NOV-1998	(TrEMBLrel. 08, Last sequence update)		DT	01-NOV-1999	(TrEMBLrel. 12, Last annotation update)	
DE	BASIC FIBROBLAST GROWTH FACTOR (FRAGMENT).			GN	BFGF.		
OS	Canis familiaris (Dog).			OC	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia; Eutheria; Carnivora; Fissipedia; Canidae; Canis.		
RP	SEQUENCE FROM N.A.			RC	TISSUE=ADRENAL GLAND;		
RA	TROCHTA O.A., JACOBS R.M., LAMARRE J.;			RT	"The role bFGF in canine Hemangiosarcoma."		
RL	Submitted (APR-1998) to the EMBL/Genbank/DBJ databases.			DR	EMBL; AF060562; AAC35912.1; -		
DR	HSSP; P09038; IBFF.			DR	PROSITE; PS00247; HBGF_FGF; 1.		
DR	PFAM; PF00167; FGF; 1.			FT	NON_TER	1	
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Query Match 32.1%; Score 511; DB 6; Length 130;							
Best Local Similarity 55.3%; Pred. No. 2.28e-95;							
Matches 73; Conservative 21; Mismatches 36; Indels 2; Gaps 1;							
Db	1	FKDPKRLKNGGFFRIHPDGRVDGVRKSDPHVKLQLOAERGVSIVSGVCANRYLAM	60				
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QY	149	DTGLLYGSGTPNEECFLERLEENHNTYISAKHAEKNWFVGLKRNKNSC-RGPRTHYQ	208				
Db	119	KAILFLPMSSAKS	130				
QY	209	KAILFLPLPVSS	220				
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ID	P78443	PRELIMINARY;		PRT;		196 AA.	

P78443;  
 01-MAY-1997 (TREMBlrel. 03, Created)  
 01-MAY-1997 (TREMBlrel. 03, Last sequence update)  
 01-NOV-1999 (TREMBlrel. 12, Last annotation update)  
 21 KD BASIC FIBROBLAST GROWTH FACTOR (BFGF).  
 GN FGF2.  
 OS Homo sapiens (Human).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
 OC Eutheria; Primates; Catarrhini; Hominidae; Homo.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 89184522.  
 RA PRATS H., KAGHAD M., PRATS A.C., KLAGSBRUN M., LELIAS J.M.,  
 RA LAUZUN P., CHALON P., TAUBER J.P., AMALRIC F., SMITH J.A., CAPUT D.;  
 RT "High molecular mass forms of basic fibroblast growth factor are  
 RT initiated by alternative CUG codons.";  
 RL Biochem. Biophys. Res. Commun. 187:1227-1231(1992).  
 DR EMBL; J04513; AA52532.1; -;  
 DR EMBL; S47380; AAD13053.1; -;  
 DR HSSP; P09038; 1BFF.  
 DR PROSITE; PS00247; HBGF\_FGF; 1.  
 DR PFAM; PF00167; FGF; 1.  
 DR PRINTS; PR00262; IL1HBGF.  
 DR PRINTS; PR00263; HBGFFGF.  
 SQ SEQUENCE 196 AA; 21203 MW; 49B75E39 CRC32;  
 Query Match 32.0%; Score 509; DB 4; Length 196;  
 Best Local Similarity 54.5%; Pred. No. 7.23e-95;  
 Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;  
 Db 65 GHFKDPKLYCKNGGFFRIHPDGVGVREKSPHKLQLOAERGVSIVKGCANRYL 124  
 QY 87 ANYKKPLLYCSNGGHFLRILPDGTVDTRSDQHIQLQSAESVGEVYIKSTGTGYL 146  
 Db 125 AMKEDGRLLAKCVGDFEFLERLESNNYRSKYT--SWYALKRTGQYKLGSKTGP 182  
 QY 147 AMDTDLGLYGSOTPNECLFLERLEENHNYIISKHAENKWFVGLKNGSKRGPRTHY 206  
 Db 183 GOKAILFLPMSAKS 196  
 207 GOKAILFLPVS 220  
 RESULT 3  
 ID P78443 PRELIMINARY; PRT; 101 AA.  
 AC P78443  
 DT 01-MAY-1997 (TREMBlrel. 03, Created)  
 DT 01-MAY-1997 (TREMBlrel. 03, Last sequence update)  
 DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)  
 DE BASIC FGF (FRAGMENT).  
 OS Cynops pyrrhogaster (Japanese common newt).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Amphibia;  
 OC Batrachia; Caudata; Salamandroidea; Salamandridae; Cynops.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RC TISSUE-EMBRYO;  
 RA SUZUKI A.S., TABATA T., SAKAGUCHI K., TAKABATAKE T., TAKESHIMA K.,  
 RA KANEDA T.;  
 RT "Serial expression of the genes in a mesodermalizing ectoderms of  
 RT early Cynops gastrula.";  
 RL Submitted (NOV-1996) to the EMBL/GenBank/DBJ databases.  
 DR EMBL; D89443; BAA13958.1; -;  
 DR HSSP; P09038; 2BFF.  
 DR PROSITE; PS00247; HBGF\_FGF; 1.

DR PFAM; PF00167; FGF; 1.  
 FT NON-TER 1 1  
 FT NON-TER 101 101  
 SQ SEQUENCE 101 AA; 11907 MW; 1CD93BB0 CRC32;  
 Query Match 24.0%; Score 382; DB 13; Length 101;  
 Best Local Similarity 53.4%; Pred. No. 1.85e-63;  
 Matches 55; Conservative 18; Mismatches 28; Indels 2; Gaps 1;  
 Db 1 PKRLYCKNGGFFLRINSKGVDGAREKSDSYIKLQLOAERGVSIVKGCANRYLAMKDD 60  
 QY 92 PKLYCSNGGHFLRILPDGTVDTRSDQHIQLQSAESVGEVYIKSTGTGYLAMDTD 151  
 Db 61 GRMLAKWITDECFERLESNNYRSKYSD--WYVALKR 101  
 QY 152 GLLYGSOTPNECLFLERLEENHNYIISKHAENKWFVGLKK 194  
 RESULT 4  
 ID Q35988 PRELIMINARY; PRT; 198 AA.  
 AC Q35988  
 DT 01-JAN-1998 (TREMBlrel. 05, Created)  
 DT 01-JAN-1998 (TREMBlrel. 05, Last sequence update)  
 DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)  
 DE RYUDOCAN CORE PROTEIN PRECURSOR.  
 OS Mus musculus (Mouse).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
 OC Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RC STRAIN=C3H/AN, AND 129SVJ;  
 RX MEDLINE; 97420681.  
 RA TSUZUKI S., KOJIMA T., KATSUMI A., YAMAZAKI T., SUGIURA I., SAITO H.;  
 RT "Molecular cloning, genomic organization, promoter activity, and  
 RT tissue-specific expression of the mouse ryudocan gene.";  
 RL J. Biochem. 122:17-24(1997).  
 CC -I- FUNCTION: CELL SURFACE PROTEOGLYCAN THAT BEARS BOTH HEPARAN  
 CC SULFATE AND CHONDROITIN SULFATE AND THAT LINKS THE CYTOSKELETON TO  
 CC THE INTERSTITIAL MATRIX. BINDS BASIC FIBROBLAST GROWTH FACTOR.  
 DR EMBL; D89571; BAA2135.1; -;  
 DR EMBL; D89572; BAA2136.1; -;  
 DR PROSITE; PS00964; SYNDECAN; 1.  
 DR PFAM; PF01034; Syndecan; 1.  
 KW Signal; Proteoglycan; Heparan sulfate; Transmembrane; Glycoprotein.  
 FT SIGNAL 1 23 POTENTIAL.  
 FT CHAIN 24 198 POTENTIAL.  
 SQ SEQUENCE 198 AA; 21482 MW; FC67B0E5 CRC32;  
 Query Match 22.5%; Score 359; DB 11; Length 198;  
 Best Local Similarity 72.0%; Pred. No. 6.87e-58;  
 Matches 67; Conservative 9; Mismatches 8; Indels 9; Gaps 6;  
 Db 1 MAPACLLAPLLLLLGGFPLVPGESTRETEVIDPQDLLEGYFSGALPDDEDA-G-G--S 56  
 QY 1 MAPARLFA-LLLFVGG--VA-ESIRETEVIDPQDLLEGYFSGALPDDEVDVVGQES 55  
 Db 57 DDFELSGDLDDEEPRPEPEVIEPLVLDNH 89  
 QY 56 DDFELSGDLDDEDSNIGPEVHVPLVLDAN 88  
 RESULT 5  
 ID Q07659 PRELIMINARY; PRT; 146 AA.  
 AC Q07659  
 DT 01-NOV-1996 (TREMBlrel. 01, Created)  
 DT 01-NOV-1996 (TREMBlrel. 01, Last sequence update)  
 DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)  
 DE FIBROBLAST GROWTH FACTOR.  
 GN BFGF.  
 OS Gallus gallus (Chicken).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;  
 OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.  
 RN [1]

DT 01-MAY-1997 (TReMBLrel. 03, Last sequence update)  
DE 01-NOV-1999 (TReMBLrel. 12, Last annotation update)  
DE KERATINOCYTE GROWTH FACTOR.  
OS Canis familiaris (Dog).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
OC Eutheria; Carnivora; Fissipedia; Canidae; Canis.  
[1]  
RN SEQUENCE FROM N.A.  
RP MEDLINE; 96226403.  
RX CANATAN H., CHANG W.Y., SUGIMOTO Y., SHIDAIFAT F., KULP S.K.,  
RA BRUEGGEMEIER R.W., LIN Y.C.;  
RA "Keratinocyte growth factor (KGF/TGF-7) has a paracrine role in canine  
RT prostate: molecular cloning of mRNA encoding canine KGF.";  
RL DNA Cell Biol. 15:247-254(1996).  
DR EMBL; U80800; AAB38972.1; -.  
DR HSSP; P05230; 2AFG.  
DR PROSITE; PS00247; HBGF\_FGF; 1.  
DR PFAM; PF00167; FGF; 1.  
DR PRINTS; PR00262; ILLHBGF.  
DR PRINTS; PR00263; HBGF\_FGF.  
SQ SEQUENCE 194 AA; 22476 MW; 2B71A8ED CRC32;

Query Match 19.0%; Score 302; DB 6; Length 194;  
Best Local Similarity 35.8%; Pred. No. 2,62e-44;  
Matches 49; Conservative 33; Mismatches 52; Indels 3; Gaps 3;

Dd 59 MEGDIRVRRLFQTC-WILRIDKRKGKVGTOBMKNYSNIMEIRTVAVGVIAIKGVSEY 117  
::: :|:|:| |:::| |:::| |:::| |:::| |:::| |:  
QY 85 LDANYKKPLLYCSNGHFLRILPDCTVDGTRDSOHIQLQSASVGEVIKSTETG 144  
:::|:|:| |:::| |:::| |:::| |:::| |:::| |:  
Dd 118 YLANMKKGKLYAKKCNDCNFELLENHYNTYASAKWTHSGGMFVALNOKGVPRK 177  
||:::|:|:| |:::| |:::| |:::| |:::| |:::| |:  
QY 145 YLAMDDGLGYSGTPNEBCFLERLEENHYNTIIS-K-KHAENKFVGLKKNSCKRG 202  
:::|:|:| |:::| |:::| |:::| |:::| |:::| |:  
Dd 178 KTKKEQKAHFLPMAIT 194  
::|:|:| |:::| |:::| |:::| |:::| |:::| |:  
QY 203 RTHYGQKAILFPLPV 219

RESULT 8  
ID 042407 PRELIMINARY; PRT; 212 AA.

AC 042407;  
DT 01-JAN-1998 (TReMBLrel. 05, Created)  
DT 01-JUN-1998 (TReMBLrel. 06, Last sequence update)  
DE 01-NOV-1999 (TReMBLrel. 12, Last annotation update)  
DE FIBROBLAST GROWTH FACTOR 10.  
OS Gallus gallus (Chicken).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;  
OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.  
[1]  
RN SEQUENCE FROM N.A.  
RP MEDLINE; 97330690.  
RX OHUCHI H., KARAGAWA T., YAMAMOTO A., ARAGA A., OHTA T., ISHIMARU Y.,  
RA YOSHIOKA H., KUWANA T., NOHNO T., YAMASAKI M., ITOH N., NOJI S.;  
RA "The mesenchymal factor, FGF10, initiates and maintains the outgrowth  
RT of the chick limb bud through interaction with FGF8, an apical  
RT ectodermal factor.";  
RL Development 124:2235-2244(1997).  
DR EMBL; D86333; BAA24945.1; -.  
DR HSSP; P03968; 1BAR.  
DR PFAM; PF00167; FGF; 1.  
DR PRINTS; PR00263; HBGF\_FGF.  
SQ SEQUENCE 212 AA; 23631 MW; C8AB1883 CRC32;

Query Match 18.9%; Score 301; DB 13; Length 212;  
Best Local Similarity 37.5%; Pred. No. 4,49e-44;  
Matches 54; Conservative 31; Mismatches 55; Indels 4; Gaps 4;

Dd 71 VRSYNHLOGDVRRKL-Y-SYNKYFLKIEKGVSKTKENCFFSILEITSVEIGVAVK 128  
|:::|:|:| |:::| |:::| |:::| |:::| |:::| |:  
QY 79 VHPVLDPDANKPKLLYCSNGHFILPDGTVDGTRDSOHIQLQSASVGEVIK 138  
|:::|:|:| |:::| |:::| |:::| |:::| |:::| |:  
Dd 129 SIKSNYYLAWNKKGKVYGSKEENSCKLKERTFNCCNYNTYASINWKHKGRMFVA;NGRC 188

Qy 139 STETQYLAAMDGLGYSQTPNECLFLERLEENHYNTIS-K-KHAEKNFVGLKNG 196  
Db 189 ATKRCQKTRKNTSAHFLPMVMS 212  
Qy 197 SCKRGRTHYGGKAILFLPLVSS 220

RESULT 9  
ID O89096 PRELIMINARY; PRT; 252 AA.  
AC O89096;  
DT 01-NOV-1998 (TREMBlrel. 08, Created)  
DT 01-NOV-1998 (TREMBlrel. 08, Last sequence update)  
DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)  
DE FHF-4B.  
OS Rattus norvegicus (Rat), and Mus musculus (Mouse).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
OC Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.  
RN [1]  
RP SEQUENCE FROM N.A.  
TX MEDLINE: 98267141.  
RA YAMAMOTO S., MIKAMI T., OHBAYASHI N., OHTA M., ITOH N.;  
RT "Structure and expression of a novel isoform of mouse FGF homologous  
RT factor (FHF)-4.";  
RL Biochim. Biophys. Acta 1398:38-41(1998).  
DR EMBL: AB008908; BAA31544.1; -  
DR EMBL: AB008907; BAA31543.1; -  
DR HSSP: P03968; IBAR.  
DR PROSITE: PS00247; HBGF\_FGF; 1.  
DR PFAM: PF00167; FGF; 1.  
SQ SEQUENCE 252 AA; 28364 MW; 1DFD5B4B CRC32;

Query Match 17.2%; Score 274; DB 11; Length 252;  
Best Local Similarity 37.5%; Pred. No. 8.79e-38;  
Matches 48; Conservative 26; Mismatches 49; Indels 5; Gaps 3;

Db 80 LYCROG-YLQMPHGALDGTDDNSTFLNLPVLRVVAQVKTGLYAMNGEYL 138  
Qy 95 LYCSNGGHFLRLPDGTVDRSDQHQLQLSAESVGEYIKSTETGQYLAAMDGLL 154  
Db 139 YPSELTPECKFKSVFENYVYISMLYRQESGRANFLGNKEGYMKNRVKTKPA 198  
Qy 155 YGSQTPNECLFLERLEENHYNTISK--KHAE--KNFVGLKNGSCKRGRTHYGGKA 210  
Db 199 AHFLPKPL 206  
Qy 211 ILFLPLPV 218

RESULT 10  
ID O54837 PRELIMINARY; PRT; 70 AA.  
AC O54837;  
DT 01-JUN-1998 (TREMBlrel. 06, Created)  
DT 01-JUN-1998 (TREMBlrel. 06, Last sequence update)  
DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)  
DE FIBROBLAST GROWTH FACTOR-1 (FRAGMENT).  
OS Mus musculus (Mouse).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
OC Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.  
RN [1]  
RP SEQUENCE FROM N.A.  
RC STRAIN=C3H/HEN; TISSUE=LIVER;  
RA ZHANG Y.-X., HACKSHAW K.V.;  
RL Submitted (JUL-1997) to the EMBL/GenBank/DBJ databases.  
DR EMBL: AF012926; AAB94020.1; -  
DR HSSP: P05230; 2AXM.  
DR PFAM: PF00167; FGF; 1.  
FT NON\_TER 70  
SQ SEQUENCE 70 AA; 7677 MW; 15A1BE5E CRC32;

Query Match 16.9%; Score 270; DB 11; Length 70;  
Best Local Similarity 92.5%; Pred. No. 7.36e-37;

Matches 37; Conservative 2; Mismatches 0; Indels 1; Gaps 1;  
Db 32 LPL-GNYKKPKLLYCSNGGHFLRLPDGTVDRSDQH 70  
Qy 83 VPLDANYKKPKLLYCSNGGHFLRLPDGTVDRSDQH 122

RESULT 11  
ID Q16089 PRELIMINARY; PRT; 59 AA.  
AC Q16089;  
DT 01-NOV-1996 (TREMBlrel. 01, Created)  
DT 01-NOV-1996 (TREMBlrel. 01, Last sequence update)  
DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)  
DE ACIDIC FIBROBLAST GROWTH FACTOR (FRAGMENT).  
OS Homo sapiens (Human)  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
OC Eutheria; Primates; Catarrhini; Homiidae; Homo.  
RN [1]  
RP SEQUENCE FROM N.A.  
RX MEDLINE: 94069734.  
RA ZHAO X.M., YEOH T.K., HIEBERT M., FRIST W.H., MILLER G.G.;  
RT "The expression of acidic fibroblast growth factor (heparin-binding  
RT growth factor-1) and cytokine genes in human cardiac allografts and T  
RL cells.";  
RL Transplantation 56:1177-1182(1993).  
DR EMBL: S67294; AAB29059.1; -  
DR HSSP: P05230; 2AXM.  
DR PFAM: PF00167; FGF; 1.  
FT NON\_TER 59  
SQ SEQUENCE 59 AA; 6595 MW; 1C932B1D CRC32;

Query Match 16.6%; Score 264; DB 4; Length 59;  
Best Local Similarity 97.2%; Pred. No. 1.76e-35;  
Matches 35; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVDRSDQH 56  
Qy 87 ANYKKPKLLYCSNGGHFLRLPDGTVDRSDQH 122

RESULT 12  
ID Q16588 PRELIMINARY; PRT; 60 AA.  
AC Q16588;  
DT 01-NOV-1996 (TREMBlrel. 01, Created)  
DT 01-NOV-1996 (TREMBlrel. 01, Last sequence update)  
DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)  
DE ACIDIC FIBROBLAST GROWTH FACTOR (FRAGMENT).  
OS Homo sapiens (Human).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
OC Eutheria; Primates; Catarrhini; Homiidae; Homo.  
RN [1]  
RP SEQUENCE FROM N.A.  
RX MEDLINE: 94069734.  
RA ZHAO X.M., YEOH T.K., HIEBERT M., FRIST W.H., MILLER G.G.;  
RT "The expression of acidic fibroblast growth factor (heparin-binding  
RT growth factor-1) and cytokine genes in human cardiac allografts and T  
RL cells.";  
RL Transplantation 56:1177-1182(1993).  
RN [2]  
RP SEQUENCE FROM N.A.  
RX MEDLINE: 92202857.  
RA LI Y.L., KHA H., GOLDEN J.A., MIGCHIELSEN A.A.J., GOETZL E.J.,  
RA TURCK E.J.;  
RT "An acidic fibroblast growth factor protein generated by alternate  
RT splicing acts like an antagonist.";  
RL J. Exp. Med. 175:1073-1080(1992).  
DR EMBL: S67292; AAB29058.1; -  
DR EMBL: X65779; CAA46662.1; -  
DR HSSP: P05230; 2AXM.  
DR PFAM: PF00167; FGF; 1.  
FT NON\_TER 60  
SQ SEQUENCE 60 AA; 6697 MW; 6CCC7DFF CRC32;

Query Match 16.6%; Score 265; DB 4; Length 60;  
 Best Local Similarity 92.1%; Pred. No. 1.04e-35;  
 Matches 35; Conservative 1; Indels 0; Gaps 0;

Db 21 GNYKKPLLYCSNGGHFLRLPDGTVGTRDRSDQHTD 58  
 QY 87 ANYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHTD 124

RESULT 13  
 ID O9YH31 PRELIMINARY; PRT; 196 AA.

AC O9YH31;  
 DT 01-MAY-1999 (Tremblrel. 10, Created)  
 DT 01-MAY-1999 (Tremblrel. 10, Last sequence update)  
 DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)  
 DE PUTATIVE FIBROBLAST GROWTH FACTOR-4.  
 OS Notophthalmus viridescens (Eastern newt) (Triturus viridescens).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Amphibia;  
 CS Batrachia; Caudata; Salamandroidea; Salamandridae; Notophthalmus.  
 [1]

SEQUENCE FROM N.A.

RA WEI Y.;  
 RT "Putative Newt Fibroblast Growth Factor-4";  
 RL Submitted (Oct-1996) to the EMBL/GenBank/DBJ databases.  
 DR EMBL; U76998; AAC98812.1; -  
 DR HSSP; P09038; 1BFF.  
 DR PROSITE; PS00247; HBGF\_FGF; 1.  
 SQ SEQUENCE 196 AA; 22033 MW; 455E08A3 CRC32;

Query Match 16.3%; Score 260; DB 13; Length 196;  
 Best Local Similarity 34.6%; Pred. No. 1.46e-34;  
 Matches 44; Conservative 31; Mismatches 48; Indels 4; Gaps 3;

Db 71 KRLRLCYNGVIGHLOVLPDGRIGHMSES-RYSLLSISPERGVCMFGVQSLFLAM 129  
 QY 90 KPKLLYCSNGGHF-LRLPDGTVGTRDRSDQHTDQIQLSASVGEVYIKSTETGQYLLAM 148

Db 130 NSKGRFGSKFSDCKFKEMLLPNYNAYESWRYPGN--YIALSKNGRAKKGNKVSPTM 187  
 QY 149 DTDGLLYGSQPTNECLFLERLEENHYTYISKRAERNFWGLKKNKSCRGPRTHYGO 208

Db 188 TVTHFLP 194

QY 209 KAILFLP 215

RESULT 14  
 ID Q9W6A1 PRELIMINARY; PRT; 243 AA.

AC Q9W6A1;  
 DT 01-NOV-1999 (Tremblrel. 12, Created)  
 DT 01-NOV-1999 (Tremblrel. 12, Last sequence update)  
 DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)  
 DE FIBROBLAST GROWTH FACTOR 12 ISOFORM A.  
 GN FGF12.  
 OS Gallus gallus (Chicken).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;  
 CC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.  
 RN [1]

RP SEQUENCE FROM N.A.

RX MEDLINE; 99065510.  
 RA MUNOZ-SANJUAN I., SIMANDL B.K., FALLON J.F., NATHANS J.;  
 RT "Expression of chicken fibroblast growth factor homologous factor  
 (FHF)-1 and of differentially spliced isoforms of FHF-2 during  
 development and involvement of FHF-2 in chicken limb development.";  
 RL Development 126:409-421(1999).  
 DR EMBL; AF108754; AAD21575.1; -  
 DR PROSITE; PS00247; HBGF\_FGF; 1.  
 SQ SEQUENCE 243 AA; 27455 MW; A9E6E8CD CRC32;

Query Match 16.1%; Score 257; DB 13; Length 243;  
 Best Local Similarity 34.4%; Pred. No. 7.05e-34;  
 Matches 44; Conservative 31; Mismatches 48; Indels 5; Gaps 3;

Db 77 LF-SQOYFLQHPDGTIDGTRKDNSTYTLNLPVGLRVVAIOGVKAGLYVAMNAGEYL 135  
 QY 95 LYCSNGGHFLRLPDGTVGTRDRSDQHTDQIQLSASVGEVYIKSTETGQYLANDTDGLL 154

Db 136 YSSDVFTPECKFKESVFNYYVYSSLYRQOESGRAFWFLGNKEGOIMKGNRVKTKPS 195  
 QY 155 YGSQTPNEECLFLERLEENHYNTYISK--KHAE--KNMFVGLKKNKSCRGPRTHYGOKA 210

Db 196 SHFVPKPI 203

QY 211 ILFLPLP 218

RESULT 15

ID O99517 PRELIMINARY; PRT; 127 AA.  
 AC O99517;  
 DT 01-MAY-1997 (Tremblrel. 03, Created)  
 DT 01-MAY-1997 (Tremblrel. 03, Last sequence update)  
 DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)  
 DE FIBROBLAST GROWTH FACTOR 12 (FRAGMENT).  
 GN FGF12.  
 OS Homo sapiens (Human).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
 CC Eutheria; Primates; Catarrhini; Homnidae; Homo.  
 RN [1]

RP SEQUENCE FROM N.A.

RA COULIER F., PONTAROTTI P., ROUBIN R., HARTUNG H., GOLDFARB M.,

RA BIRNBAUM D.;

RL J. Mol. Evol. 0:0-0(0).

DR EMBL; Z70276; CAA94240.1; -

DR HSSP; P03968; IAF.

DR PROSITE; PS00247; HBGF\_FGF; 1.

DR PFAM; PF00167; FGF; 1

FT NON\_TER 127 127

SQ SEQUENCE 127 AA; 14478 MW; 10E2842D CRC32;

Query Match 15.8%; Score 251; DB 4; Length 127;  
 Best Local Similarity 34.6%; Pred. No. 1.64e-32;  
 Matches 44; Conservative 30; Mismatches 48; Indels 5; Gaps 3;

Db 2 LF-SQOYFLQHPDGTIDGTRKDNSTYTLNLPVGLRVVAIOGVKAGLYVAMNAGEYL 60

QY 95 LYCSNGGHFLRLPDGTVGTRDRSDQHTDQIQLSASVGEVYIKSTETGQYLANDTDGLL 154

Db 61 YSSDVFTPECKFKESVFNYYVYSSLYRQOESGRAFWFLGNKEGOIMKGNRVKTKPS 120

QY 155 YGSQTPNEECLFLERLEENHYNTYISK--KHAE--KNMFVGLKKNKSCRGPRTHYGOKA 210

Db 121 SHFVPKPI 127

QY 211 ILFLPLP 217

Search completed: Tue Aug 29 15:39:15 2000  
 Job time : 61 secs.



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W P E R L A  
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(TM)

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MPSrch\_pp protein - protein database search, using Smith-Waterman algorithm  
on: Tue Aug 29 15:52:44 2000; MasPar time 7.52 Seconds  
629.670 Million cell updates/sec  
Abular output not generated.

Title: >US-09-121-017B-17  
Description: (1-200) from US09121017B.pap  
Perfect Score: 1442  
Sequence: 1 MAPARLFAALLFFVGVGAES.....PRTHYGQKAILFLPLPVSSD 200

Scoring table: PAM 150  
Gap 11

Searched: 188963 seqs, 23686106 residues

Post-processing: Minimum Match 0%  
Listing first 45 summaries

Database: ageneseq36  
genesep

Statistics: Mean 31.783; Variance 131.440; scale 0.242

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description	Pred. No.
1	985	68.3	154	1	W92283 Human beta-endothelial	2.04e-86
2	985	68.3	154	1	W75414 Human beta-endothelial	2.04e-86
3	985	68.3	154	1	W06816 Human beta-endothelial	2.04e-86
4	985	68.3	154	1	W04805 Human beta-endothelial	2.04e-86
5	985	68.3	155	1	W75415 Human beta-endothelial	2.04e-86
6	985	68.3	155	1	W75711 Human endothelial cell	2.04e-86
7	985	68.3	155	1	R80776 Fibroblast growth fact	2.04e-86
8	985	68.3	155	1	P70482 Fibroblast growth fact	2.04e-86
9	985	68.3	155	1	P94037 Sequence encoded by co	2.04e-86
10	985	68.3	155	1	R73022 Human acidic fibroblas	2.04e-86
11	985	68.3	155	1	W50812 Fibroblast growth fact	2.04e-86
12	985	68.3	155	1	W92291 Human endothelial cell	2.04e-86
13	985	68.3	165	1	R05785 Human BECGF encoded by	2.04e-86
14	985	68.3	168	1	W06818 Human endothelial cell	2.04e-86
15	983	68.2	134	1	W75413 Human alpha-endothelia	3.26e-86
16	983	68.2	134	1	W52282 Human alpha-endothelia	3.26e-86
17	983	68.2	134	1	W04807 Human alpha-endothelia	3.26e-86
18	984	68.2	140	1	W04806 Human acidic fibroblas	2.58e-86
19	984	68.2	140	1	R74647 Human recombinant aFGF	2.58e-86
20	984	68.2	140	1	R34497 Human acidic Fibroblas	2.58e-86
21	984	68.2	140	1	P70995 Sequence of human prot	2.58e-86
22	984	68.2	140	1	R25914 Human acidic fibroblas	2.58e-86
23	984	68.2	140	1	P90068 Human acid fibroblast	2.58e-86

24	984	68.2	141	1	R10527 Human acidic fibroblas	2.58e-86
25	984	68.2	151	1	R05789 Human aFGF encoded by	2.58e-86
26	974	67.5	156	1	W71383 Fibroblast growth fact	2.70e-85
27	972	67.4	135	1	W06817 Human endothelial cell	4.33e-85
28	960	66.6	132	1	R11327 9 N-terminal residue d	7.25e-84
29	960	66.6	132	1	R25418 aFGF mutain #2.	7.25e-84
30	954	66.2	155	1	R25570 Recombinant human Ala1	2.97e-83
31	954	66.2	155	1	W00561 Human (Gly93) aFGF ana	2.97e-83
32	948	65.7	140	1	R65935 Fibroblast growth fact	1.21e-82
33	938	65.0	129	1	R25419 aFGF mutain #3.	1.27e-81
34	938	65.0	129	1	R11328 12 N-terminal residue	1.27e-81
35	922	63.9	154	1	R05315 Human acidic fibroblas	5.42e-80
36	917	63.6	140	1	P90069 Bovine acidic fibrobla	1.75e-79
37	917	63.6	140	1	R74648 Bovine recombinant aFG	1.75e-79
38	917	63.6	140	1	R13030 Brain-derived acidic f	1.75e-79
39	917	63.6	140	1	R65934 Bovine fibroblast grow	1.75e-79
40	917	63.6	140	1	R34496 Bovine acidic fibrobla	1.75e-79
41	917	63.6	140	1	R25915 Human acidic fibroblas	1.75e-79
42	916	63.5	154	1	P90074 Recombinant human muta	2.22e-79
43	906	62.8	141	1	R25569 Recombinant bovine Ala	2.31e-78
44	906	62.8	141	1	W00560 Bovine (Ala47, Gly93) a	2.31e-78
45	900	62.4	136	1	W01747 Chimeric acid/basic fi	9.44e-78

ALIGNMENTS

RESULT 1  
ID W92283 standard; protein; 154 AA.  
AC W92283;  
DT 20-APR-1999 (first entry)  
DE Human beta-endothelial cell growth factor (ECGF) protein sequence.  
KW Endothelial cell growth factor; ECGF; cleavable; recombinant; repair;  
OS regenerate; blood vessel; endothelial cell; human.  
PN Homo sapiens.  
US5849538-A.  
PD 15-DEC-1998.  
PF 11-APR-1997; 840088.  
PR 04-NOV-1996; US-743261.  
PR 03-MAR-1986; US-835594.  
PR 18-DEC-1987; US-134499.  
PR 29-APR-1991; US-693079.  
PR 27-NOV-1991; US-799859.  
PR 03-NOV-1994; US-334884.  
PR 07-JUN-1995; US-472964.  
PR 11-APR-1997; US-840088.  
PA (RHON ) RHONE-POULENC RORER PHARM INC.  
PI Burgess W, Drohan WN, Jaye M, MacIag T;  
DR WPI; 99-069734/06.

PT DNA encoding a cleavable signal peptide and an endothelial cell  
growth factor - useful for producing recombinant endothelial cell  
PT growth factor proteins  
PS Claim 1; Column 16; 23pp; English.  
CC This represents the amino acid sequence of human beta-endothelial cell  
growth factor (ECGF). The invention is directed to DNA encoding alpha-  
or beta-ECGF and plasmids comprising the DNA sequences. The DNA encodes a  
cleavable signal peptide and an ECGF, where removal of the signal peptide  
yields a mature form of the ECGF. The DNA is used to produce recombinant  
ECGF proteins, which can be used in treatments to repair or regenerate  
blood vessels or other structures lined with endothelial cells.  
SQ Sequence 154 AA;

Query Match 68.3%; Score 985; DB 1; Length 154;  
Best Local Similarity 93.8%; Pred. No. 2.04e-86;  
Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db	12	TEKFNLP-PC--NYKKPKLYCSNGGHFLRLPDGTGVTGTRDSQHQIQLSAESVGEV	68
QY	55	SDPELSSGSDANYKKPKLYCSNGGHFLRLPDGTGVTGTRDSQHQIQLSAESVGEV	114
Db	69	YIKSTGTQYAMDTCGLYGSQTPNEECFLERLEENHYNTYISKKAENKFNVLGKKN	128
QY	115	YIKSTGTQYAMDTCGLYGSQTPNEECFLERLEENHYNTYISKKAENKFNVLGKKN	174

Db 129 GSKRGPRTHYGOKAILFLPLPVSSD 154  
 QY 175 GSKRGPRTHYGOKAILFLPLPVSSD 200

## RESULT 2

ID W75414 standard; protein; 154 AA.  
 AC W75414;  
 DT 02-MAR-1999 (first entry)  
 DE Human beta-endothelial cell growth factor.  
 KW Human; endothelial cell growth factor; ECGF; brain stem; probe;  
 OS Hybridisation; bovine; wound healing; prosthetic device.  
 PN US5827826-A.  
 PD 27-OCT-1998. 743261.  
 PF 04-NOV-1996; US-743261.  
 PR 04-NOV-1996; US-743261.  
 PR 03-MAR-1986; US-835594.  
 PR 18-DEC-1987; US-134499.  
 PR 29-APR-1991; US-693079.  
 PR 27-NOV-1991; US-799859.  
 PR 03-NOV-1994; US-334884.  
 PR 07-JUN-1995; US-472964.  
 PA (RHON ) RHONE-POULENC RORER PHARM INC.  
 PI Burgess W, Drohan WN, Jaye M, Maciag T;  
 WPI: 98-594032/50.  
 DT Compositions for promoting wound healing - containing endothelial  
 PT cell growth factor polypeptides  
 PS Claim 1; Column 16; 23pp; English.  
 CC This sequence represents the amino acid sequence of the mature human  
 CC beta-endothelial cell growth factor (b-ECGF). This amino acid sequence  
 CC is identical to the alpha-ECGF but the beta sequence contains an extra  
 CC 20 N-terminal amino acids. The sequence was isolated from a human brain  
 CC stem cell cDNA library using a probe designed based on fragments of the  
 CC bovine ECGF (see W75416-W75418). The ECGF protein can be used in  
 CC compositions for promoting wound healing. ECGF is also used to grow  
 CC cells on a prosthetic device.  
 SQ Sequence 154 AA;

Query Match 68.3%; Score 985; DB 1; Length 154;  
 Best Local Similarity 93.8%; Pred. No. 2.04e-86;  
 Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 12 TEKFNLP-PG--NYKKPKLLYCSNGHFLRLPDGTVDGTRDRSDQHILQLSAESVGEV 68  
 QY 55 SDFELSGSGDANYKKPKLLYCSNGHFLRLPDGTVDGTRDRSDQHILQLSAESVGEV 114  
 Db 69 YKSTETGOYLAMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKHAENWFVGLKKN 128  
 QY 115 YKSTETGOYLAMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKHAENWFVGLKKN 174  
 Db 129 GSKRGPRTHYGOKAILFLPLPVSSD 154  
 QY 175 GSKRGPRTHYGOKAILFLPLPVSSD 200

## RESULT 3

ID W06816 standard; protein; 154 AA.  
 AC W06816;  
 DT 17-MAR-1997 (first entry)  
 DE Human endothelial cell growth factor-beta.  
 KW Endothelial cell growth factor-beta; ECGF-beta.  
 OS Homo sapiens.  
 PN US5571790-A.  
 PD 05-NOV-1996. 835594.  
 PF 03-MAR-1986; US-835594.  
 PR 03-MAR-1986; US-835594.  
 PR 18-DEC-1987; US-134499.  
 PR 29-APR-1991; US-693079.  
 PR 27-NOV-1991; US-799859.  
 PR 03-NOV-1994; US-334884.  
 PR 07-JUN-1995; US-472964.  
 PA (RHON ) RHONE-POULENC RORER PHARM INC.

PI Burgess W, Drohan WN, Jaye M, Maciag T;  
 DR WPI: 96-505421/50.  
 DR N-PSDB: T45983.  
 PT Recombinant human endothelial cell growth factors - for treating  
 PT damaged blood vessels, etc.  
 PS Claim 1; Column 16; 22pp; English.  
 CC Human recombinant endothelial cell growth factors (ECGF) beta  
 CC (W06816) and alpha (W06817) differ only at their N-terminal ends.  
 CC They can be produced in transformed prokaryotic or eukaryotic host  
 CC cells using DNA sequences (T45983 and T45984, respectively) derived  
 CC from the complete human ECGF cDNA (T45985). Large quantities of  
 CC the ECGFs are produced by culturing the host cells and recovering  
 CC the proteins. ECGFs have utility in the growth and amplification  
 CC of endothelial cells in culture. They can potentially be used to  
 CC treat damaged blood vessels and other endothelial cell-lined  
 CC structures, and also have diagnostic applns.  
 SQ Sequence 154 AA;

Query Match 68.3%; Score 985; DB 1; Length 154;  
 Best Local Similarity 93.8%; Pred. No. 2.04e-86;  
 Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 12 TEKFNLP-PG--NYKKPKLLYCSNGHFLRLPDGTVDGTRDRSDQHILQLSAESVGEV 68  
 QY 55 SDFELSGSGDANYKKPKLLYCSNGHFLRLPDGTVDGTRDRSDQHILQLSAESVGEV 114  
 Db 69 YKSTETGOYLAMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKHAENWFVGLKKN 128  
 QY 115 YKSTETGOYLAMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKHAENWFVGLKKN 174  
 Db 129 GSKRGPRTHYGOKAILFLPLPVSSD 154  
 QY 175 GSKRGPRTHYGOKAILFLPLPVSSD 200

## RESULT 4

ID W04805 standard; Protein; 154 AA.  
 AC W04805;  
 DT 29-DEC-1996 (first entry)  
 DE Human beta-endothelial cell growth factor.  
 KW Endothelial cell growth factor; ECGF; blood vessel; regeneration;  
 KW heparin-Sepharose affinity chromatography; probe; oligonucleotide;  
 OS Homo sapiens.  
 PN US5552528-A.  
 PD 03-SEP-1996. 835594.  
 PF 03-MAR-1986; US-835594.  
 PR 03-MAR-1986; US-835594.  
 PR 18-DEC-1987; US-134499.  
 PR 29-APR-1991; US-693079.  
 PR 27-NOV-1991; US-799859.  
 PR 03-NOV-1994; US-334884.  
 PA (RHON ) RHONE-POULENC RORER PHARM INC.  
 PI Burgess W, Maciag T;  
 DR WPI: 96-412132/41.  
 DR N-PSDB: T37503.  
 PT Isolated, purified, biologically active bovine beta endothelial cell  
 PT growth factor - useful to regenerate or treat damaged blood vessels  
 PS Disclosure; Fig 8; 28pp; English.  
 CC Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having  
 CC a mol.wt. of 20 kD can be purified at least 16300 fold from bovine  
 CC brain using heparin-Sepharose affinity chromatography. ECGF is  
 CC useful for among other purposes, diagnostic applications and has  
 CC potential in the treatment of damaged blood vessels or other  
 CC endothelial cell-lined structures.  
 CC Human ECGF (T37503) or fragments may be obtained using  
 CC oligonucleotides (T37504 and T37508 to T37509) whose design is based  
 CC on the sequence of bovine alpha- and beta-ECGF.  
 SQ Sequence 154 AA;

Query Match 68.3%; Score 985; DB 1; Length 154;  
 Best Local Similarity 93.8%; Pred. No. 2.04e-86;  
 Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;



Db	13	TEKFNLIP - PG - - NYKKPKLLYCSNGGHFLRLPDGTVDGTRDSDOHIOQLQLSAESVGEV	69
		: : : : :	
QY	55	SDDFETSGSGDANYKKPKLLYCSNGGHFLRLPDGTVDGTRDSDOHIOQLQLSAESVGEV	114
Db	70	YIKSTETGOYLANDTGLLYGSTPNEECFLERLEENHYNTYISKHAEKNFVGLKKN	129
QY	115	YIKSTETGOYLANDTGLLYGSTPNEECFLERLEENHYNTYISKHAEKNFVGLKKN	174

	Query Match	68.3%;	Score 985;	DB 1;	Length 155;
	Best Local Similarity	93.8%;	Pred. No. 2.04e-86;		
	Matches 137;	Conservative	5;	Mismatches 1;	Indels 3; Gaps
Db	13	TEKFNLFP-PC--NYKKPKLLYCSNGHFLRLILPDGTVGTRDRSDQHIQLQLSAESVGEV 6			
	:	:	:	:	:
	:	:	:	:	:
Qy	55	SDDFELSGSGCDANYKKPKLLYCSNGHFLRLILPDGTVGTRDRSDQHIQLQLSAESVGEV 1			
Db	70	YIKSTGTQYLANDTDGLLYGSQGTNEECFLFLERLEENHYNTYTSKKHAENKWFVGLKKN 1			
	:	:	:	:	:
	:	:	:	:	:
Qy	115	YIKSTGTQYLANDTDGLLYGSQGTNEECFLFLERLEENHYNTYTSKKHAENKWFVGLKKN 1			
Db	130	GSCKRGRPRTHYGGKAILFLPLPVSDD 155			

.....

[illegible]

Db	74	YIKSTETGOYLAMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKHAENWFVGLKKN	133
Ov	115	YIKSTETGOYLAMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKHAENWFVGLKKN	174

RESULT	15	
ID	W75413	standard; protein; 134 AA.
AC	W75413;	
DT	02-MAR-1999	(first entry)
DE	Human alpha-endothelial cell growth factor.	
KW	Human; endothelial cell growth factor; ECGF; brain stem; probe;	
KW	hybridisation; bovine; wound healing; prosthetic device.	
OS	Homo sapiens.	
PN	US5827826-A.	
PD	27-OCT-1998.	
PF	04-NOV-1996;	743261.





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M P S R L A  
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(TM)

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MPsrch\_pp protein - protein database search, using Smith-Waterman algorithm

on: Tue Aug 29 15:52:11 2000; Maspar time 12.09 seconds  
780.657 Million cell updates/sec

abular' output not generated.

Title: >US-09-121-017B-17-  
Description: (1-200) from US09121017B.pep  
Perfect Score: 1442  
Sequence: 1 MAPARLALLLFFVGVAES.....PRTHYGKAILFLPLPVSSD 200

Scoring table: PAM 150  
Gap 11

Searched: 142080 seqs, 47172406 residues

Post-processing: Minimum Match 0%  
Listing first 45 summaries

Database: pir64  
1:pir1 2:pir2 3:pir3 4:pir4

Statistics: Mean 44.238; Variance 77.971; scale 0.567

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	DB	ID	Description	Pred. No.
1	985	68.3	155	1	A33665	acidic fibroblast gro	5.53e-196
2	967	67.1	155	1	A60721	acidic-fibroblast gro	9.67e-192
3	966	67.0	155	2	D37360	acidic fibroblast gro	1.66e-191
4	966	67.0	155	2	S04147	acidic fibroblast gro	1.66e-191
5	954	66.2	152	2	JH0476	acidic fibroblast gro	1.11e-188
6	917	63.6	155	1	GR040	acidic fibroblast gro	5.63e-180
7	916	63.5	155	2	A60130	acidic fibroblast gro	9.68e-180
8	906	62.8	155	2	JW0055	fibroblast growth fac	2.16e-177
9	522	36.2	189	2	A48834	basic fibroblast grow	1.58e-88
10	516	35.8	146	1	S00185	basic fibroblast grow	3.60e-87
11	516	35.8	157	1	GR080	basic fibroblast grow	3.60e-87
12	509	35.3	210	2	A32398	basic fibroblast grow	1.38e-85
13	508	35.2	154	2	C37360	basic fibroblast grow	2.32e-85
14	508	35.2	154	2	A31674	basic fibroblast grow	2.32e-85
15	498	34.5	164	2	S31622	basic fibroblast grow	4.18e-83
16	493	34.2	155	1	A40117	basic fibroblast grow	5.60e-82
17	466	32.3	137	2	I45711	fibroblast growth fac	6.51e-76
18	455	31.6	198	2	JC1457	ryudocan precursor -	1.89e-73
19	350	24.3	208	2	A48137	fibroblast growth fac	2.60e-50
20	350	24.3	208	2	S66486	fibroblast growth fac	2.60e-50
21	329	22.8	207	2	JC5941	fibroblast growth fac	8.82e-46
22	324	22.5	207	2	JC5940	fibroblast growth fac	1.04e-44
23	302	20.9	194	2	S49501	keratinocyte growth f	5.11e-40

24	301	20.9	202	2	A42410 ryudocan precursor	8.32e-40
25	299	20.7	194	1	A36301 fibroblast growth fac	2.21e-39
26	295	20.5	194	2	I48610 keratinocyte growth f	1.55e-38
27	293	20.3	194	2	S26049 fibroblast growth fac	4.08e-38
28	288	20.0	187	2	S23595 embryonic fibroblast	4.62e-37
29	278	19.3	264	2	A36207 transforming protein	5.77e-35
30	275	19.1	192	2	S54407 embryonic Fibroblast	2.44e-34
31	276	19.1	194	2	I50710 fibroblast growth fac	1.51e-34
32	276	19.1	266	2	S68144 fibroblast growth fac	1.51e-34
33	269	18.7	267	1	TVHUP5 transforming protein	4.33e-33
34	268	18.6	198	2	JC5613 ryudocan precursor	6.99e-33
35	266	18.4	60	2	JH0708 fibroblast growth fac	1.82e-32
36	266	18.4	256	2	JC4627 fibroblast growth fac	1.82e-32
37	263	18.2	206	2	JC4268 HST protein - bovine	7.60e-32
38	257	17.8	168	2	JG0184 fibroblast growth fac	1.32e-30
39	255	17.7	206	1	TVHUNS fibroblast growth fac	3.40e-30
40	248	17.2	208	2	S20102 fibroblast growth fac	9.28e-29
41	244	16.9	220	2	I50588 FGF-3 - chicken	6.09e-28
42	236	16.4	125	2	A32484 basic fibroblast grow	2.57e-26
43	236	16.4	237	1	S39582 transforming protein	2.57e-26
44	235	16.3	208	2	S14192 fibroblast growth fac	4.09e-26
45	234	16.2	97	2	B46289 keratinocyte growth f	6.52e-26

ALIGNMENTS

RESULT	1	A33665	#type complete
ENTRY		acidic fibroblast growth factor 1 precursor - human	
TITLE		beta-EGF; endothelial cell growth factor beta;	
ALTERNATE_NAMES		heparin-binding growth factor 1	
ORGANISM		#formal name Homo sapiens #common name man	
DATE		10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change	
ACCESSIONS		A33665; A32316; S18217; A43804; A24662; JH0707; S35535; S35536; I39413; A23553; A24820; A24243; A26386; A53639	
REFERENCE		A33665	
#authors		Mergia, A.; Tischer, E.; Graves, D.; Tumolo, A.; Miller, J.; Gospodarowicz, D.; Abraham, J.A.; Shipley, G.D.; Fiddes, J.C.	
#journal		Biochem. Biophys. Res. Commun. (1989) 164:1121-1129	
#title		Structural analysis of the gene for human acidic fibroblast growth factor.	
#cross-references		MUID:90073637	
#accession		A33665	
#molecule_type		DNA	
#residues		1-155	#label MER
#cross-references		GB:M30491	
REFERENCE		A32316	
#authors		Wang, W.P.; Lehtoma, K.; Varban, M.L.; Krishnan, I.; Chiu, I.M.	
#journal		Mol. Cell. Biol. (1989) 9:2387-2395	
#title		Cloning of the gene coding for human class 1 heparin-binding growth factor and its expression in fetal tissues.	
#cross-references		MUID:89343957	
#accession		A32316	
#molecule_type		DNA	
#residues		1-155	#label WAN
#cross-references		GB:M23087; NID:g183875; PIDN:AAA52638.1; PID:g386768	
REFERENCE		S18217	
#authors		Wang, W.P.; Quick, D.; Balcerzak, S.P.; Needleman, S.W.; Chiu, I.M.	
#journal		Oncogene (1991) 6:1521-1529	
#title		Cloning and sequence analysis of the human acidic fibroblast growth factor gene and its preservation in leukemia patients.	
#cross-references		MUID:92019819	
#accession		S18217	
#molecule_type		DNA	
#residues		1-155	#label WA2
#cross-references		EMBL:M23086	
REFERENCE		A43804	





```

Db 130 GSKRGRPRTHYGQKAILFLPLPVSSD 155
      |||
QY 175 GSKRGRPRTHYGQKAILFLPLPVSSD 200

RESULT 2
ENTRY #155 #label HEB
TITLE #residues 1-155 #label HEB
ALTERNATE_NAMES #type complete
ORGANISM #formal_name Mus musculus #common_name house mouse
DATE 17-Apr-1993 #sequence_revision 17-Apr-1993 #text_change
16-Jul-1999
ACCESSIONS D37360; JC5231
REFERENCE #authors Hebert, J.M.; Basilico, C.; Goldfarb, M.; Haub, O.; Martin, G.R.
#journal Dev. Biol. (1990) 138:454-463
#title Isolation of cDNAs encoding four mouse FGF family members and characterization of their expression patterns during embryogenesis.
#cross-references MIM:90201563
#accession D37360
#status preliminary
#molecule_type mRNA
#residues 1-155 #label HEB
#cross-references GB:M30641; NID:G193284; PIDN:AAA37618.1; PID:G309236
REFERENCE JC5231
#authors Madai, F.; Hackshaw, K.V.; Chiu, I.M.
#journal Gene (1996) 179:231-236
#title Cloning and characterization of the mouse Fgf-1 gene.
#cross-references MIM:917128312
#accession JC5231
#status preliminary

```

```

##molecule_type DNA
##residues 1-155 #label MAD
##cross-references GB:U36456
COMMENT This protein is an inducer of neovascularization in angiogenic disease including atherosclerosis, cancer and inflammatory autoimmune disease.

GENETICS
#gene Fgf-1
#introns 57/1; 91/3
#superfamily fibroblast growth factor
CLASSIFICATION #length 155 #molecular-weight 17417 #checksum 9341
SUMMARY

Query Match 67.0%; Score 966; DB 2; Length 155;
Best Local Similarity 96.3%; Pred. No. 1.66e-191;
Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVDGTRDSQHIQLQLSAESAGEVYIKGTETGOYL 80
      :|||
QY 66 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDSQHIQLQLSAESAGEVYIKGTETGOYL 125
      :|||
Db 81 AMDTEGLLYGSQTPNECLFLERLEENHYNTYTSKKHAENWFVGLKKNKSGCKRGRPTHY 140
      :|||
QY 126 AMDTDGLLYGSQTPNECLFLERLEENHYNTYTSKKHAENWFVGLKKNKSGCKRGRPTHY 185
      :|||
Db 141 GQKAILFLPLPVSSD 155
      |||
QY 186 GQKAILFLPLPVSSD 200

RESULT 4
ENTRY #155 #label GOO
TITLE #type complete
ALTERNATE_NAMES acidic fibroblast growth factor 1 - rat
ORGANISM #formal_name Rattus norvegicus #common_name Norway rat
DATE 28-Feb-1990 #sequence_revision 28-Feb-1990 #text_change
16-Jul-1999
ACCESSIONS S04147
REFERENCE #authors Goodrich, S.P.; Yan, G.C.; Bahrenburg, K.; Mansson, P.E.
#journal Nucleic Acids Res. (1989) 17:2867
#title The nucleotide sequence of rat heparin binding growth factor 1 (HBGF-1).
#cross-references MIM:89240051
#accession S04147
##molecule_type mRNA
##residues 1-155 #label GOO
##cross-references EMBL:X14232; NID:956351; PIDN:CAA32448.1; PID:956352
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341

Query Match 67.0%; Score 966; DB 2; Length 155;
Best Local Similarity 96.3%; Pred. No. 1.66e-191;
Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVDGTRDSQHIQLQLSAESAGEVYIKGTETGOYL 80
      :|||
QY 66 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDSQHIQLQLSAESAGEVYIKGTETGOYL 125
      :|||
Db 81 AMDTEGLLYGSQTPNECLFLERLEENHYNTYTSKKHAENWFVGLKKNKSGCKRGRPTHY 140
      :|||
QY 126 AMDTDGLLYGSQTPNECLFLERLEENHYNTYTSKKHAENWFVGLKKNKSGCKRGRPTHY 185
      :|||
Db 141 GQKAILFLPLPVSSD 155
      |||
QY 186 GQKAILFLPLPVSSD 200

RESULT 5
ENTRY #155 #label fragment
TITLE #type fragment
ALTERNATE_NAMES acidic fibroblast growth factor - pig (fragment)
ORGANISM #formal_name Sus scrofa domestica #common_name domestic pig
DATE 31-Mar-1992 #sequence_revision 31-Mar-1992 #text_change

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16-Jul-1999
ACCESSIONS JH0476; S20072
REFERENCE JH0476
#authors Schmidt, M.; Sharma, H.S.; Schott, R.J.; Schaper, W.
#journal Biochem. Biophys. Res. Commun. (1991) 180:853-859
#title Amplification and sequencing of mRNA encoding acidic
#cross-references MUID:92062117 fibroblast growth factor (aFGF) from porcine heart.
#accession JH0476
#molecule_type mRNA
#residues 1-152 ##label SCH
#cross-references EMBL:X60317; NID:g1873; PIDN:CAA42869.1; PID:g1874
#experimental_source heart
#note the hydrophobic core residues are packed around the
internal symmetry axis
COMMENT This protein belongs to the fibroblast growth factor family.
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
FEATURE
22-28 #region nuclear location signal\
133 #binding site heparin (Lys) status predicted
SUMMARY
#length 152 #checksum 1124
Query Match 66.2%; Score 954; DB 2; Length 152;
Best Local Similarity 91.6%; Pred. No. 1.11e-188;
Matches 131; Conservative 6; Mismatches 3; Indels 3; Gaps 2;
Db 13 TEKFNLP-PG--NYKKPKLLYCSNGHFLRLPDGTVDGTRDRSDQHTQLQLSAESVGEV 69
QY 55 SDDFELSGDGNAYKKPKLLYCSNGHFLRLPDGTVDGTRDRSDQHTQLQLSAESVGEV 114
Db 70 YIKSTETGOYLANDYSGLLYGSGTSECLFLERLEENHNTYTSKKAENKWFVGLKKN 129
QY 115 YIKSTETGOYLANDYDGLLYGSGTSECLFLERLEENHNTYTSKKAENKWFVGLKKN 174
Db 130 GSKRGPRTHYGOKAILFLPLPV 152
QY 175 GSKRGPRTHYGOKAILFLPLPV 197
RESULT 6
ENTRY #type complete
TITLE acidic fibroblast growth factor precursor - bovine
ALTERNATE_NAMES aFGF; eye-derived growth factor II; heparin-binding growth
factor I; prostatin
ORGANISM #formal_name Bos primigenius taurus #common_name cattle
DATE 13-Aug-1986 #sequence_revision 03-Feb-1994 #text_change
18-Jun-1999
CESSIONS
JH0613; S02102; S02661; S22065; B24663; A94281; S03953;
A91010; A24477; B25043; C25043; A24539; A60884;
A37892; B37892; A61198; I46024; A34477; A01385
JH0613
REFERENCE Renaud, F.; Desset, S.; Bugra, K.; Halley, C.; Philippe,
J.M.; Courtois, Y.; Laurent, M.
#journal Biochem. Biophys. Res. Commun. (1992) 184:945-952
#title Heterogeneity of 3' untranslated region of bovine acidic FGF
transcripts.
#cross-references MUID:92246990
#accession JH0613
#molecule_type DNA
#residues 58-155 ##label REN
REFERENCE S02102
#authors Halley, C.; Courtois, Y.; Laurent, M.
#journal Nucleic Acids Res. (1988) 16:10913
#title Nucleotide sequence of bovine acidic fibroblast growth factor
cDNA.
#cross-references MUID:89083506
#accession S02102
#molecule_type mRNA
#residues 1-155 ##label HAL
#cross-references EMBL:X13221; NID:g347; PIDN:CAA31610.1; PID:g348
REFERENCE S02661
#authors Alterio, J.; Halley, C.; Brou, C.; Soussi, T.; Courtois, Y.;

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Laurent, M.
#journal FEBS Lett. (1988) 242:41-46
#title Characterization of a bovine acidic FGF cDNA clone and its
expression in brain and retina.
#cross-references MUID:89078619
#accession S02661
#molecule_type mRNA
#residues 1-155 ##label ALT
#cross-references EMBL:X14032; NID:g322; PIDN:CAA32192.1; PID:g323
REFERENCE S22065
#authors Philippe, J.M.
#submission submitted to the EMBL Data Library, May 1992
#accession S22065
#molecule_type mRNA
#residues 1-18 ##label PHI
#cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
REFERENCE A94290
#authors Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman,
J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal Science (1986) 233:545-548
#title Nucleotide sequence of a bovine clone encoding the angiogenic
protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession B24663
#molecule_type mRNA
#residues 62-102 ##label ABR
REFERENCE A94281
#authors Gimenez-Gallego, G.; Rodkey, J.; Bennett, C.; Rios-Candelore,
M.; DiSalvo, J.; Thomas, K.
#journal Science (1985) 230:1385-1388
#title Brain-derived acidic fibroblast growth factor: complete amino
acid sequence and homologies.
#cross-references MUID:86070224
#accession A94281
#molecule_type protein
#residues 16-155 ##label GIM
REFERENCE S03953
#authors Quinkler, W.; Maasberg, M.; Bernotat-Danielowski, S.; Luethe,
N.; Sharma, H.S.; Schaper, W.
#journal Eur. J. Biochem. (1989) 181:67-73
#title Isolation of heparin-binding growth factors from bovine,
porcine and canine hearts.
#cross-references MUID:89231704
#accession S03953
#molecule_type protein
#residues 16-45 ##label QUI
REFERENCE A91010
#authors Bohlen, P.; Esch, F.; Baird, A.; Gospodarowicz, D.
#journal EMBO J. (1985) 4:1951-1956
#title Acidic fibroblast growth factor (FGF) from bovine brain:
amino-terminal sequence and comparison with basic FGF.
#cross-references MUID:86055750
#accession A91010
#molecule_type protein
#residues 16-30, 'X', 32-34, 'X', 35-44 ##label BOH
REFERENCE A24477
#authors Crabb, J.W.; Armes, L.G.; Carr, S.A.; Johnson, C.M.; Roberts,
G.D.; Bordoli, R.S.; McKeenan, W.L.
#journal Biochemistry (1986) 25:4988-4993
#title Complete primary structure of prostatin, a prostate
epithelial cell growth factor.
#cross-references MUID:87026586
#accession A24477
#molecule_type protein
#residues 2, 'GE', 5-155 ##label CRA
REFERENCE A94127
#authors Burgess, W.H.; Mehrlan, T.; Marshak, D.R.; Fraser, B.A.;
Maciag, T.
#journal Proc. Natl. Acad. Sci. U.S.A. (1986) 83:7216-7220
#title Structural evidence that endothelial cell growth factor beta
is the precursor of both endothelial cell growth factor
alpha and acidic fibroblast growth factor.
#cross-references MUID:87016918

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#accession B25043
#molecule_type protein
#residues 2-155 #label BUR
#note this form was designated beta endothelial cell growth
factor

#accession C25043
#molecule_type protein
#residues 16-155 #label B02
#note this form was designated acidic fibroblast growth factor

#accession A25043
#molecule_type protein
#residues 22-155 #label B03
#note this form was designated alpha endothelial cell growth
factor

REFERENCE
#authors Strödom, D.J.; Harper, J.W.; Lobb, R.R.
#journal Biochemistry (1986) 25:945-951
#title Amino acid sequence of bovine brain derived class 1
heparin-binding growth factor.

#cross-references MUID:86187766
#accession A24539
#molecule_type protein
#residues 16-155 #label STR

REFERENCE
#authors Thomas, K.A.; Gimenez-Gallego, G.; Rios-Candelore, M.;
Disalvo, J.
#journal J. Protein Chem. (1987) 6:163-171
#title Primary structure and mitogenic and angiogenic activities of
brain-derived acidic fibroblast growth factor.

#accession A60884
#molecule_type protein
#residues 16-155 #label THO

REFERENCE
#authors Kuo, M.D.; Huang, S.S.; Huang, J.-S.
#journal J. Biol. Chem. (1990) 265:16455-16463
#title Acidic fibroblast growth factor receptor purified from bovine
liver is a novel protein tyrosine kinase.

#cross-references MUID:90375514
#accession A37892
#molecule_type protein
#residues 22-30,'X',32-38 #label KU2
#note this form was designated brain-derived growth factor A

#accession B37892
#molecule_type protein
#residues 62-76,'X',78-86 #label KUO
#note this sequence is an amino-terminal fragment of a form
designated as brain-derived growth factor B

REFERENCE
#authors A61198
Hill, C.E.; Belford, D.A.; Godovac-Zimmermann, J.; Hendry,
I.A.
#journal Brain Res. Dev. Brain Res. (1991) 63:13-19
#title Class 1 heparin binding growth factor promotes the
differentiation but not the survival of ciliary neurones in
vivo.

#cross-references MUID:92164087
#accession A61198
#molecule_type protein
#residues 11-26;28-50;53-110,'H',112,'NTY',134-155 #label HIL

REFERENCE
#authors Philippe, J.M.; Renaud, F.; Desset, S.; Laurent, M.; Mallet,
J.; Courtois, Y.; Edwards, J.B.
#journal Biochem. Biophys. Res. Commun. (1992) 188:843-850
#title Cloning of two different 5' untranslated exons of bovine
acidic fibroblast growth factor by the single strand
ligation to single-stranded cDNA methodology.

#cross-references MUID:93075172
#accession I46024
#status translated from GB/EMBL/DBJ
#molecule_type mRNA
#residues 1-18 #label PH2
#cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
A34477
#authors Sasaki, H.; Hoshi, H.; Hong, Y.M.; Suzuki, T.; Kato, T.;
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Sasaki, H.; Saito, M.; Youki, H.; Karube, K.; Konno, S.;
Onodera, M.; Saito, T.; Aoyagi, S.
J. Biol. Chem. (1989) 264:17606-17612
#journal Purification of acidic fibroblast growth factor from bovine
#title heart and its localization in the cardiac myocytes.
#cross-references MUID:9008933
#accession A34477
#status preliminary
#molecule_type protein
#residues 16-24;121-127;134-143 #label SAS
#experimental_source heart
#comment The acidic and basic fibroblast growth factors are the major
endothelial-cell growth factors. Both are angiogenic agents in
vivo and are potent mitogens for a variety of mesoderm-derived
cell types in vitro (although bFGF is 30-100 times more potent
than aFGF in stimulating the proliferation of normal diploid
cells). There are differences in the tissue distribution and
concentration of these two growth factors.
#comment This protein binds heparin, although less strongly than does bFGF.
#comment There are some sequence similarities between residues 117-126 (a
region flanked by Lys-Lys dipeptides) and a number of
neuropeptides, including a gastrin-releasing peptide from the pig

....
Note: remainder of annotations omitted.

Query Match 63.6%; Score 917; DB 1; Length 155;
Best Local Similarity 91.9%; Pred. No. 5.63e-180;
Matches 124; Conservative 6; Mismatches 5; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGYFLRLPDGTVDGTRSDQHIQLQLSAESVGEVIKSTETGQFL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 66 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRSDQHIQLQLSAESVGEVIKSTETGQYL 125

Db 81 AMDPDGLLYCSQTPNEBCLFLERLEENHYNTYISKKAEXHWFVGLKKNKSKLGPRTHF 140
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 126 AMDPDGLLYCSQTPNEBCLFLERLEENHYNTYISKKAEXHWFVGLKKNKSKRGPRTHY 185
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Db 141 GQKAILFLPLPVSSD 155
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 186 GQKAILFLPLPVSSD 200

RESULT 7
ENTRY #type complete
TITLE A60130
ALTERNATE_NAMES acidic fibroblast growth factor - chicken
#formal_name Gallus gallus #common_name chicken
DATE 03-Mar-1993 #sequence_revision 03-Mar-1993 #text_change
16-Jul-1999
ACCESSIONS A60130; S02639
REFERENCE A60130
#authors Schnuerch, H.; Risau, W.
#journal Development (1991) 111:1143-1154
#title Differentiating and mature neurons express the acidic
fibroblast growth factor gene during chick neural
development.
#cross-references MUID:91347925
#accession A60130
#status preliminary
#molecule_type mRNA
#residues 1-155 #label SCH
#cross-references GB:S63263; NID:g234372; PIDN:AAB19629.1; PID:g234373
S02639
#authors Risau, W.; Gautschi-Sova, P.; Boehlen, P.
#journal EMBO J. (1988) 7:959-962
#title Endothelial cell growth factors in embryonic and adult chick
brain are related to human acidic fibroblast growth factor.
#cross-references MUID:88296438
#accession S02639
#molecule_type protein
#residues 22-30,'X',32-44,'X',46-48 #label RIS
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor
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SUMMARY      #length 155 #molecular-weight 17322 #checksum 7617
Query Match      63.5%; Score 916; DB 2; Length 155;
Best Local Similarity 90.4%; Pred. No. 9.68e-180;
Matches 122; Conservative 6; Mismatches 7; Indels 0; Gaps 0;

Db 21 GNYKPKLYCSNGGHFLRILPDGVTGTRDRSDQHILQLSAEDVGEYIKSTAGQYL 80
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 66 ANYKPKLYCSNGGHFLRILPDGVTGTRDRSDQHILQLSAESVGEYIKSTETGQYL 125
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 81 AMDTNGLLYGSQTPSECLFLERLEENHYNTYISKHAEDKKNFVGLKNGSKLGPRTY 140
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 126 AMDTDGLYGSQTPNECLFLERLEENHYNTYISKHAENKFNWVGLKNGSKRGPRTHY 185
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 141 GOKAILFLPLPVSSD 155
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 186 GOKAILFLPLPVSSD 200
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 8
ENTRY   JW0055 #type complete
TITLE   fibroblast growth factor-1 - sheep
ALTERNATE_NAMES
ORGANISM For-1
DATE      #formal_name Ovis sp. #common_name sheep
          17-Jun-1998 #sequence_revision 10-Jul-1998 #text_change
          07-May-1999
ACCESSIONS JW0055
REFERENCE   #authors
            Grieb, T.W.; Ring, M.; Brown, E.; Palmer, C.; Belle, N.;
            Donjerkovic, D.; Chang, H.; Yun, J.; Subramanian, R.;
            Forozan, F.; Guo, Y.; Vertes, A.; Winkles, J.A.; Burgess,
            W.H.
            Biochem. Biophys. Res. Commun. (1998) 246:182-191
            Primary structure of ovine fibroblast growth factor-1 deduced
            by protein and cDNA analysis.
            #cross-references MUID:98262939
            #accession JW0055
            #molecule_type mRNA
            #residues 1-155 #label GRI
COMMENT   This protein is a potent mitogenic factor for NIH 3T3 fibroblasts
          in the absence of heparin.
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY      #length 155 #molecular-weight 17557 #checksum 8890

Query Match      62.8%; Score 906; DB 2; Length 155;
Best Local Similarity 90.4%; Pred. No. 2.16e-177;
Matches 122; Conservative 8; Mismatches 5; Indels 0; Gaps 0;

Db 21 GNYKPKLYCSNGGHFLRILPDGVTGTRDRSDQHILQLYAESTIGEYIKSTETGQFL 80
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 66 ANYKPKLYCSNGGHFLRILPDGVTGTRDRSDQHILQLSAESVGEYIKSTETGQYL 125
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 81 AMDTNGLLYGSQTPSECLFLERLEENHYNTYISKHAENKFNWVGLKNGSKLGPRTY 140
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 126 AMDTDGLYGSQTPNECLFLERLEENHYNTYISKHAENKFNWVGLKNGSKRGPRTHY 185
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 141 GOKAILFLPLPVSSD 155
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 186 GOKAILFLPLPVSSD 200
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 9
ENTRY   A48834 #type complete
TITLE   basic fibroblast growth factor - chicken
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE      #formal_name Gallus gallus #sequence_revision 18-Nov-1994 #text_change
          16-Jul-1999
ACCESSIONS A48834; S23636
REFERENCE   #authors
            Borja, A.Z.; Meijers, C.; Zeller, R.
            Dev. Biol. (1993) 157:110-118
            Expression of alternatively spliced bcrf first coding exons
            and antisense mRNAs during chicken embryogenesis.

#cross-references MUID:93246053
#accession A48834
#status preliminary
#molecule_type nucleic acid
#residues 1-189 #label BOR
#experimental_source embryo
#note      sequence extracted from NCBI backbone (NCBIN:131000,
          NCBI:131001)

REFERENCE S23636
#authors Mitrani, E.; Gruenbaum, Y.; Shohat, H.; Ziv, T.
#journal Development (1990) 109:387-393
#title Fibroblast growth factor during mesoderm induction in the
          early chick embryo.
#cross-references MUID:90382254
#accession S23636
#status preliminary
#molecule_type DNA
#residues 95-128 #label MIT
#cross-references EMBL:X56804; NID:g62855; PIDN:CAA40139.1; PID:g62856
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY      #length 189 #molecular-weight 20312 #checksum 8538

Query Match      36.2%; Score 522; DB 2; Length 189;
Best Local Similarity 54.5%; Pred. No. 1.58e-88;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

Db 58 GHFKDPKLYCKNGGFFLRINPDGRTGVDGVRKSDPHIKLQLQAEERGVSITKGVSANREL 117
      :|||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 66 ANYKPKLYCSNGGHFLRILPDGVTGTRDRSDQHILQLSAESVGEYIKSTETGQYL 125
      :|||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 118 AMKEDGRLLALKATECEFFPERLESNNYTSRKYSYD--WYVALKRTGYKPKPTGP 175
      :|||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 126 AMDTDGLYGSQTPNECLFLERLEENHYNTYISKHAENKFNWVGLKNGSKRGPRTHY 185
      :|||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 176 GOKAILFLPLPVSS 189
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 186 GOKAILFLPLPVSS 199
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 10
ENTRY   S00185 #type complete
TITLE   basic fibroblast growth factor - sheep
ALTERNATE_NAMES
ORGANISM #formal_name Ovis orientalis aries, Ovis ammon aries
          #common_name domestic sheep
          10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change
          10-Sep-1999
ACCESSIONS S00185
REFERENCE   #authors
            Simpson, R.J.; Moritz, R.L.; Lloyd, C.J.; Fabri, L.J.; Nice,
            E.C.; Rubira, M.R.; Burgess, A.W.
            FEBS Lett. (1987) 224:128-132
            Primary structure of ovine pituitary basic fibroblast growth
            factor.
#cross-references MUID:88055577
#accession S00185
#molecule_type protein
#residues 1-146 #label SIM
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding; mitogen
FEATURE
          107-110
          18-22
          #region heparin binding #status predicted\
          #region heparin binding #status predicted
SUMMARY      #length 146 #molecular-weight 16434 #checksum 3560

Query Match      35.8%; Score 516; DB 1; Length 146;
Best Local Similarity 55.2%; Pred. No. 3.60e-87;
Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;

Db 15 GHFKDPKLYCKNGGFFLRINPDGRTGVDGVRKSDPHIKLQLQAEERGVSITKGVCANLYL 74
      :|||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 66 ANYKPKLYCSNGGHFLRILPDGVTGTRDRSDQHILQLSAESVGEYIKSTETGQYL 125
      :|||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
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CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS alternative splicing; angiogenesis; growth factor; heparin
binding; mitogen

FEATURE
1-157 #product basic fibroblast growth factor, uterine form
#status predicted #label MAT1\
4-157 #product basic fibroblast growth factor, pituitary gamma
#form #status experimental #label MAT2\
12-157 #product basic fibroblast growth factor, pituitary alpha
#form #status experimental #label MAT3\
16-157 #product basic fibroblast growth factor, pituitary short
#form #status predicted #label MAT4\
23-157 #product basic fibroblast growth factor, hepatic form
#status experimental #label MAT5\
27-157 #product basic fibroblast growth factor, renal form
#status experimental #label MAT6\
29-33,118-121 #region heparin binding #status predicted\
4 #modified site blocked amino end (Ala) (in mature form
pituitary gamma) (probably acetylated) #status
experimental
#length 157 #checksum 1115

MMARY
Query Match 35.8%; Score 516; DB 1; Length 157;
Best Local Similarity 55.2%; Pred. No. 3.60e-87;
Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;

Db 26 GHEKDPKRLCKNGGFFRIHPDGVGVREKSDPHIKLOLQAEERGVVSIKGVCANRYL 85
QY 66 ANKKPKLLYCSGGHFRILPDGVDRSDQHILQLSASVGVYIKSTETGOYL 125
Db 86 AMKEDGRLLACKVDECFERLESNNYTRSRKYS--SWYVAKRRTGYKLGPKTGP 143
QY 126 AMDTDGLYGSOTPNECLFLERLEENYNYISKHAEKNFVGLKNGSKRGPRTHY 185
Db 144 GOKAILFLPMGAKS 157
QY 186 GOKAILFLPVSS 199

RESULT 12
ENTRY A32398 #type complete
TITLE basic fibroblast growth factor precursor, 22.5K form - human
ALTERNATE_NAMES bFGF; fibroblast growth factor 2; prostatic growth factor;
prostatropin
CONTAINS basic fibroblast growth factor, 18K form
ORGANISM #formal_name Homo sapiens #common_name man
DATE 31-Jul-1989 #sequence_revision 31-Dec-1993 #text_change
16-Jul-1999
A32398; A61537; A36642; B32878; S00297; A54316; B54316;
A33624; A25824; B24243; B24301; S42242; B55784; I52267;
S46253
A32398
REFERENCE #authors Prats, H.; Kaghad, M.; Prats, A.C.; Klagsbrun, M.; Lelias,
J.N.; Liauzun, P.; Chalon, P.; Tauber, J.P.; Amalric, F.;
Smith, J.A.; Caput, D.
#journal Proc. Natl. Acad. Sci. U.S.A. (1989) 86:1836-1840
#title High molecular mass forms of basic fibroblast growth factor
are initiated by alternative CUG codons.
#cross-references MUID:89184522
#accession A32398
#molecule_type mRNA
#residues 1-210 #label PRA
##cross-references GB:J04513; NID:g183083; PIDN:AAAS2531.1; PID:g459811
REFERENCE A61537
#authors Shibata, F.; Baird, A.; Florkiewicz, R.Z.
#journal Growth Factors (1991) 4:277-287
#title Functional characterization of the human basic fibroblast
growth factor gene promoter.
#cross-references MUID:92110035
#accession A61537
#molecule_type DNA
#residues 1-114 #label SHI
#note authors translated the codon GGA for residue 47 as Ala

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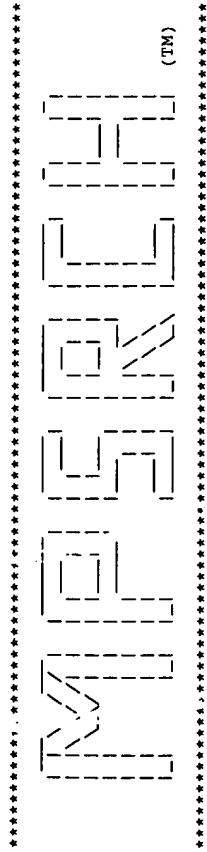
REFERENCE A26642
#authors Kurokawa, T.; Sasada, R.; Iwane, M.; Igarashi, K.
#journal FEBS Lett. (1987) 213:189-194
#title Cloning and expression of cDNA encoding human basic
fibroblast growth factor.
#cross-references MUID:87162468
#accession A26642
#molecule_type mRNA
#residues 56-210 #label KUR
##cross-references GB:M7968; NID:g182562; PIDN:AAAS2448.1; PID:g182563
REFERENCE A90924
#authors Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes,
J.C.
#journal Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668
#title Human basic fibroblast growth factor: nucleotide sequence,
genomic organization, and expression in mammalian cells.
#cross-references MUID:87217066
#accession B32878
#molecule_type mRNA
#residues 56-210 #label ABR
#note the authors translated the codon GAA for residue 108 as
Gly
REFERENCE S00297
#authors Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Friedman,
J.; Gospodarowicz, D.; Fiddes, J.C.
#journal EMBO J. (1986) 5:2523-2528
#title Human basic fibroblast growth factor: nucleotide sequence and
genomic organization.
#cross-references MUID:87053817
#accession S00297
#status not compared with conceptual translation
#molecule_type DNA
#residues 1-155 #label AB2
#note the authors translated the codon GAA for residue 108 as
Gly
REFERENCE A54316
#authors Shimoyama, Y.; Gotoh, M.; Ino, Y.; Sakamoto, M.; Kato, K.;
Hirohashi, S.
#journal Jpn. J. Cancer Res. (1991) 82:1263-1270
#title Characterization of high-molecular-mass forms of basic
fibroblast growth factor produced by hepatocellular
carcinoma cells: possible involvement of basic fibroblast
growth factor in hepatocarcinogenesis.
#cross-references MUID:92091228
#accession A54316
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#experimental_source C-1121 hepatocellular carcinoma cell line
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#accession B54316
#molecule_type protein
#residues 'XXX', 19, 'X', 21-29 #label SH2
#note sequence extracted from NCBI backbone (NCBIP:71594)
REFERENCE A33624
#authors Feige, J.J.; Bradley, J.D.; Fryburg, K.; Farris, J.; Cousens,
L.C.; Barr, P.J.; Baird, A.
#journal J. Cell Biol. (1989) 109:3105-3114
#title Differential effects of heparin, fibronectin, and laminin on
the phosphorylation of basic fibroblast growth factor by
protein kinase C and the catalytic subunit of protein
kinase A.
#cross-references MUID:90078343
#accession A33624
#status preliminary
#molecule_type protein
#residues 57-210 #label FEI
REFERENCE A25824
#authors Story, M.T.; Esch, F.; Shimasaki, S.; Sasse, J.; Jacobs,
S.C.; Lawson, R.K.
#journal Biochem. Biophys. Res. Commun. (1987) 142:702-709
#title Amino-terminal sequence of a large form of basic fibroblast
growth factor isolated from human benign prostatic
hyperplastic tissue.

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#cross-references MUI  
#accession B55784







Relea a 3.1A John F. Collins, Biocomputing Research Unit.  
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MPsrch\_pp prot.in - protein database search, using Smith-Waterman algorithm

on: Tue Aug 29 15:49:04 2000; MasPar time 7.81 Seconds  
793.887 Million cell updates/sec

ular output not generated.

Title: JS-09-121-017B-17  
Description: 1-2007 from-US09121017B.pep  
Perfect Score: 1.42  
Sequence: 1 MAPARLFALLFFVGGVAES.....PRTHYGOKAILFLPLPVSSD 200

Scoring table: PAM 150  
Gap 11

Searched: 85661 seqs, 30989116 residues

Post-processing: Minimum Match 0%  
Listing first 45 summaries

Database: swiss-prot38  
:SWISSprot

Statistics: Mean 45.057; Variance 70.010; scale 0.644

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description	Pred. No.
1	985	68.3	155	1	FGF1_HUMAN	HEPARIN-BINDING GROWTH 4.07e-222
2	967	67.1	155	1	FGF1_MESAU	HEPARIN-BINDING GROWTH 2.61e-217
3	966	67.0	155	1	FGF1_MOUSE	HEPARIN-BINDING GROWTH 4.82e-217
4	954	66.2	152	1	FGF1_PIG	HEPARIN-BINDING GROWTH 7.69e-214
5	917	63.6	155	1	FGF1_BOVIN	HEPARIN-BINDING GROWTH 5.59e-204
6	916	63.5	155	1	FGF1_CHICK	HEPARIN-BINDING GROWTH 1.03e-203
7	522	36.2	158	1	FGF2_CHICK	HEPARIN-BINDING GROWTH 2.08e-100
8	516	35.8	155	1	FGF2_SHEEP	HEPARIN-BINDING GROWTH 7.16e-99
9	516	35.8	155	1	FGF2_BOVIN	HEPARIN-BINDING GROWTH 7.16e-99
10	509	35.3	155	1	FGF2_HUMAN	HEPARIN-BINDING GROWTH 7.97e-97
11	508	35.2	154	1	FGF2_MOUSE	HEPARIN-BINDING GROWTH 7.97e-97
12	508	35.2	154	1	FGF2_RAT	HEPARIN-BINDING GROWTH 7.97e-97
13	498	34.5	156	1	FGF2_MONDO	HEPARIN-BINDING GROWTH 2.85e-94
14	493	34.2	155	1	FGF2_XENLA	HEPARIN-BINDING GROWTH 5.38e-93
15	466	32.3	137	1	FGF2_RABIT	HEPARIN-BINDING GROWTH 3.94e-86
16	455	31.6	198	1	SDCA4_HUMAN	SYNDECAN-4 PRECURSOR ( 2.40e-83
17	360	25.0	209	1	FGF9_XENLA	GLIA-ACTIVATING FACTOR 1.25e-59
18	350	24.3	208	1	FGF9_MOUSE	GLIA-ACTIVATING FACTOR 3.57e-57
19	350	24.3	208	1	FGF9_HUMAN	GLIA-ACTIVATING FACTOR 3.57e-57
20	350	24.3	208	1	FGF9_RAT	GLIA-ACTIVATING FACTOR 3.57e-57
21	329	22.8	207	1	FGFG_HUMAN	FIBROBLAST GROWTH FACT 4.71e-52
22	324	22.5	207	1	FGFG_RAT	FIBROBLAST GROWTH FACT 7.68e-51
23	302	20.9	194	1	FGF7_SHEEP	KERATINOCYTE GROWTH FA 1.53e-45

24	301	20.9	202	1	SDCA4_RAT	SYNDECAN-4 PRECURSOR ( 2.65e-45
25	299	20.7	194	1	FGF7_HUMAN	KERATINOCYTE GROWTH FA 7.99e-45
26	295	20.5	194	1	FGF7_MOUSE	KERATINOCYTE GROWTH FA 7.21e-44
27	288	20.0	187	1	FGFA_XENLA	FIBROBLAST GROWTH FACT 3.34e-42
28	278	19.3	264	1	FGF5_MOUSE	FIBROBLAST GROWTH FACT 7.80e-40
29	277	19.2	208	1	FGFA_HUMAN	FIBROBLAST GROWTH FACT 1.34e-39
30	277	19.2	215	1	FGFA_RAT	FIBROBLAST GROWTH FACT 1.34e-39
31	275	19.1	192	1	FGFB_XENLA	FIBROBLAST GROWTH FACT 3.98e-39
32	276	19.1	194	1	FGF4_CHICK	FIBROBLAST GROWTH FACT 2.31e-39
33	276	19.1	194	1	FGF4_RAT	FIBROBLAST GROWTH FACT 2.31e-39
34	274	19.0	266	1	FGF5_MOUSE	FIBROBLAST GROWTH FACT 6.84e-39
35	273	18.9	209	1	FGFA_MOUSE	FIBROBLAST GROWTH FACT 1.18e-38
36	273	18.9	247	1	FGFE_HUMAN	FIBROBLAST GROWTH FACT 1.18e-38
37	271	18.3	194	1	FGF7_RAT	KERATINOCYTE GROWTH FACT 3.47e-38
38	269	18.7	268	1	FGF5_HUMAN	FIBROBLAST GROWTH FACT 3.47e-37
39	268	18.6	198	1	SDCA4_MOUSE	SYNDECAN-4 PRECURSOR ( 1.76e-37
40	266	18.4	256	1	FGF4_BOVIN	FIBROBLAST GROWTH FACT 5.17e-37
41	266	18.4	256	1	FGF3_BRARE	FIBROBLAST GROWTH FACT 5.17e-37
42	263	18.2	225	1	FGFB_HUMAN	FIBROBLAST GROWTH FACT 2.60e-36
43	257	17.8	225	1	FGFB_MOUSE	FIBROBLAST GROWTH FACT 6.51e-35
44	256	17.8	243	1	FGFC_HUMAN	FIBROBLAST GROWTH FACT 1.11e-34
45	255	17.7	206	1	FGF4_HUMAN	FIBROBLAST GROWTH FACT 1.90e-34

ALIGNMENTS

RESULT	1	STANDARD;	PRT;	155 AA.
ID	FGF1_HUMAN			
AC	P05230; P07502;			
DT	13-AUG-1987 (Rel. 05, Created)			
DT	13-AUG-1987 (Rel. 05, Last sequence update)			
DT	15-JUL-1999 (Rel. 38, Last annotation update)			
DE	HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF) (BETA-ENDOTHELIAL CELL GROWTH FACTOR) (ECGF-BETA)			
DE	BETA)			
GN	FGF1 OR FGFA.			
OS	Homo sapiens (Human).			
OC	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;			
OC	Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.			
RN	[1]			
RP	SEQUENCE FROM N.A.			
RX	MEDLINE; 86261805.			
RA	Jaye M., Howk R., Burgess W., Ricca G.A., Chiu I.-M., Ravera M.W., O'Brien S.J., Modi W.S., Maciag T., Drohan W.N.;			
RA	"Human endothelial cell growth factor: cloning, nucleotide sequence, and chromosome localization."			
RT	Science 233:541-545(1986).			
RL	[2]			
RN	SEQUENCE FROM N.A.			
RP	SEQUENCE-BRAIN STEM;			
RC	MEDLINE; 89343957.			
RX	Wang W.P., Lehtoma K., Varban M.L., Krishnan I., Chiu I.M.;			
RA	"Cloning of the gene coding for human class I heparin-binding growth factor and its expression in fetal tissues."			
RT	Mol. Cell. Biol. 9:2387-2395(1989).			
RL	[3]			
RN	SEQUENCE FROM N.A.			
RP	TISSUE-BRAIN STEM;			
RC	MEDLINE; 90265618.			
RX	Chiu I.M., Wang W.P., Lehtoma K.;			
RA	"Alternative splicing generates two forms of mRNA coding for human heparin-binding growth factor 1."			
RT	Oncogene 5:755-762(1990).			
RL	[4]			
RN	SEQUENCE FROM N.A.			
RP	MEDLINE; 90073637.			
RX	Mergia A., Tischer E., Graves D., Tumolo A., Miller J., Gospodarowicz D., Abraham J.A., Shipley G.D., Fiddes J.C.;			
RA	"Structural analysis of the gene for human acidic fibroblast growth factor."			
RT	Biochem. Biophys. Res. Commun. 164:1121-1129(1989).			
RL	[5]			
RN	SEQUENCE FROM N.A.			
RP				

RT MEDLINE; 92019819.  
RA Wang W.P., Quick D., Balcerzak S.P., Needleman S.W., Chiu I.M.;  
RT "Cloning and sequence analysis of the human acidic fibroblast growth  
RT factor gene and its preservation in leukemia patients.";  
RL Oncogene 6:1521-1529(1991).  
RN [6]  
RP SEQUENCE FROM N.A.  
RA MEDLINE; 92202857.  
RA Li Y.L., Kha H., Golden J.A., Migchielsen A.A.J., Goetzl E.J.,  
RA Turk E.J.;  
RT "An acidic fibroblast growth factor protein generated by alternate  
RT splicing acts like an antagonist.";  
RL J. Exp. Med. 175:1073-1080(1992).  
RN [7]  
RP SEQUENCE OF 1-154 FROM N.A.  
RA MEDLINE; 94069734.  
RA Zhao X.M., Yech T.K., Hiebert M., Frist W.H., Miller G.G.;  
RT "The expression of acidic fibroblast growth factor (heparin-binding  
RT growth factor-1) and cytokine genes in human cardiac allografts and T  
RT cells.";  
RL Transplantation 56:1177-1182(1993).  
RN [8]  
RP SEQUENCE OF 1-40 FROM N.A.  
RA MEDLINE; 90365758.  
RA Crumley G., Dionne C.A., Jaye M.;  
RT "The gene for human acidic fibroblast growth factor encodes two  
RT upstream exons alternatively spliced to the first coding exon.";  
RL Biochem. Biophys. Res. Commun. 171:7-13(1990).  
RN [9]  
RP SEQUENCE OF 16-155.  
RA MEDLINE; 86296647.  
RA Harper J.W., Strydom D.J., Lobb R.R.;  
RT "Human class I heparin-binding growth factor: structure and homology  
RT to bovine acidic brain fibroblast growth factor.";  
RL Biochemistry 25:4037-4103(1986).  
RN [10]  
RP SEQUENCE OF 16-155.  
RA MEDLINE; 86295741.  
RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;  
RT "The complete amino acid sequence of human brain-derived acidic  
RT fibroblast growth factor.";  
RL Biochem. Biophys. Res. Commun. 138:611-617(1986).  
RN [11]  
RP SEQUENCE OF 16-155.  
RA MEDLINE; 87048871.  
RA Gautschi-Sova P., Mueller T., Boehlen P.;  
RT "Amino acid sequence of human acidic fibroblast growth factor.";  
RL Biochem. Biophys. Res. Commun. 140:874-880(1986).  
RN [12]  
RP SEQUENCE OF 16-47.  
RA MEDLINE; 86186784.  
RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;  
RT "Human brain-derived acidic and basic fibroblast growth factors:  
RT amino terminal sequences and specific mitogenic activities.";  
RL Biochem. Biophys. Res. Commun. 135:541-548(1986).  
RN [13]  
RP SEQUENCE OF 16-49.  
RA MEDLINE; 86275260.  
RA Gautschi P., Frater-Schroeder M., Boehlen P.;  
RT "Partial molecular characterization of endothelial cell mitogens from  
RT human brain: acidic and basic fibroblast growth factors.";  
RL FEBS Lett. 204:203-207(1986).  
RN [14]  
RP X-RAY CRYSTALLOGRAPHY (2.0 ANGSTROMS).  
RA MEDLINE; 96194129.  
RA Blaber M., Disalvo J., Thomas K.A.;  
RT "X-ray crystal structure of human acidic fibroblast growth factor.";  
RL Biochemistry 35:2086-2094(1996).  
RN [15]  
RP STRUCTURE BY NMR OF 24-155.  
RA MEDLINE; 94358885.  
RA Pineda-Lucena A., Jimenez M.A., Nieto J.L., Santoro J., Rico M.,  
RA Gimenez-Gallego G.;  
RT "1H-NMR assignment and solution structure of human acidic fibroblast  
RT growth factor activated by inositol hexasulfate.";  
RL J. Mol. Biol. 242:81-98(1994).  
RN [16]  
RP STRUCTURE BY NMR OF 24-155.  
RA MEDLINE; 97107535.  
RA Pineda-Lucena A., Jimenez M.A., Lozano R.M., Nieto J.L., Santoro J.,  
RA Rico M., Gimenez-Gallego G.;  
RT "Three-dimensional structure of acidic fibroblast growth factor in  
RT solution: effects of binding to a heparin functional analog.";  
RL J. Mol. Biol. 264:162-178(1996).  
RN [17]  
RP STRUCTURE BY NMR OF 25-155.  
RA MEDLINE; 98387896.  
RA Lozano R.M., Jimenez M., Santoro J., Rico M., Gimenez-Gallego G.;  
RT "Solution structure of acidic fibroblast growth factor bound to 1,3,  
RT 6-naphthalenesulfonate: a minimal model for the anti-tumoral  
RT action of suramin and suradistas.";  
RL J. Mol. Biol. 281:899-915(1998).  
RN [18]  
RP FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC  
CC -1- SUBUNIT: MONOMER.  
CC  
CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY  
CC THAN DOES bFGF.  
CC  
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
CC  
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CC  
CC EMBL; M13361; AAA79245.1;  
CC EMBL; X51943; CAA36206.1;  
CC EMBL; X51943; CAA36206.1;  
CC EMBL; M30492; AAA52446.1;  
CC EMBL; M30490; AAA52446.1; JOINED.  
CC EMBL; M30491; AAA52446.1; JOINED.  
CC EMBL; M60515; AAA51672.1;  
CC EMBL; M60516; AAA51673.1;  
CC EMBL; M23087; AAA52638.1;  
CC EMBL; M23086; AAA52638.1; JOINED.  
CC EMBL; S67291; AAB29057.1;  
CC EMBL; X55778; CAA46661.1;  
CC PIR; A23553; A23553.  
CC PIR; A24243; A24243.  
CC PIR; A24301; A24301.  
CC PIR; A24662; A24662.  
CC PIR; A24820; A24820.  
CC PIR; A26386; A26386.  
CC PIR; A33665; A33665.  
CC PIR; S18217; S18217.  
CC PDB; 2AFG; 15-OCT-95.  
CC PDB; 1AXM; 22-APR-98.  
CC PDB; 2AXM; 22-APR-98.  
CC PDB; 1RML; 11-NOV-98.  
CC MIM; 131220;  
CC PFAM; PF00167; FGF; 1.  
CC PRINTS; PR00262; IL1HGF.  
CC PRINTS; PR00263; HGFEGF.  
CC PROSITE; PS00247; HBGF\_FGF; 1.  
KW Growth factor; Mitogen; Vascularization; Heparin-binding; Acetylation;  
KW 3D-structure.  
FT PROPEP 1 15 HEPARIN-BINDING GROWTH FACTOR 1.  
FT CHAIN 16 155 ACETYLATION  
FT MOD\_RES 2 2 HEPARIN (POTENTIAL).  
FT BINDING 24 28 HEPARIN (POTENTIAL).  
FT BINDING 113 116 HEPARIN (POTENTIAL).  
FT SEQUENCE 155 AA; 17460 MW; F5868BFB09F1580 CRC64;  
SQ











VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.

-1- SUBUNIT: MONOMER.

-1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES AFGF.

-1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.

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EMBL: M13440; ARA30518.1; -

PIR: A24663; GKBOB.

PIR: A24819; A24819.

PIR: A32878; A32878.

PDB: 1BAS; 31-OCT-93.

PFAM: PF00167; FGF; 1.

PRINTS: PR00262; ILIHGFG.

PRINTS: PR00263; HBGFGFG.

PROSITE: PS00247; HBGFG\_FGF; 1.

KW Growth factor; Mitogen; Vascularization; Heparin-binding;

3D-structure.

PROPEP 1 9

FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.

FT CHAIN 25 155 KIDNEY-DERIVED GROWTH FACTOR.

FT SITE 46 48 CELL ATTACHMENT SITE (POTENTIAL).

FT SITE 88 90 CELL ATTACHMENT SITE (POTENTIAL).

FT BINDING 27 31 HEPARIN (POTENTIAL).

FT BINDING 116 119 HEPARIN (POTENTIAL).

FT STRAND 30 34 HEPARIN (POTENTIAL).

FT TURN 35 38

FT STRAND 39 43

FT TURN 45 46

FT STRAND 49 52

FT TURN 55 56

FT HELIX 58 60

FT STRAND 62 68

FT TURN 69 70

FT STRAND 71 76

FT TURN 77 80

FT STRAND 81 85

FT TURN 87 88

FT STRAND 91 94

FT HELIX 99 101

FT STRAND 103 107

FT TURN 109 110

FT STRAND 113 117

FT TURN 121 122

FT STRAND 124 124

FT STRAND 127 127

FT TURN 129 130

FT STRAND 133 133

FT HELIX 136 138

FT TURN 141 142

FT HELIX 144 146

FT STRAND 148 151

FT STRAND 155 AA; 17250 MW; BEGCE70FA6107129 CRC64;

SQ SEQUENCE 155 AA; 17250 MW; BEGCE70FA6107129 CRC64;

Query Match

Best Local Similarity 55.2%; Pred. No. 7.16e-99;

Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;

DB 24 GHFKDPKRLYCKNGGFFLRHPDGRVDGVREKSDPHIKLQLOAEEGVVYVSGVCANRYL 83

QY 66 ANVKPKLLYCSNGGHFLRLPDGTVDGFRSDQHIQLLSAESVGEVYIKSTETGOYL 125

DB 84 AMKEDGRLLASCVDECFERLESNNVTYRSKYS--SHYVALKRTGQYKLPKPTGP 141

QY 126 AMDTDGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 185

DB 142 GQKAILFPMSSAKS 155

QY 186 GQKAILFPLFVSS 199

RESULT 10

ID FGF2\_HUMAN STANDARD; PRT; 155 AA.

AC P09038;

DT 01-NOV-1988 (Rel. 09, Created)

DT 01-NOV-1988 (Rel. 09, Last sequence update)

DT 01-NOV-1997 (Rel. 35, Last annotation update)

DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF) (PROSTATROPIN).

GN FGF2 OR FGF2.

OS Homo sapiens (Human).

OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;

OC Mammalia; Euthera; Primates; Catarrhini; Homnidae; Homo.

RN [1]

RP SEQUENCE FROM N.A.

RX MEDLINE; 87053817.

RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Friedman J.,

RA Gospodarowicz D., Fiddes J.C.;

RT "Human basic fibroblast growth factor: nucleotide sequence and

RT genomic organization.";

RL EMBO J. 5:2523-2528(1986).

RN [2]

RP SEQUENCE FROM N.A.

RX MEDLINE; 87217066.

RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Fiddes J.C.;

RT "Human basic fibroblast growth factor: nucleotide sequence, genomic

RT organization, and expression in mammalian cells.";

RL Cold Spring Harb. Symp. Quant. Biol. 51:657-668(1986).

RN [3]

RP SEQUENCE FROM N.A.

RX MEDLINE; 87213238.

RA Sommer A., Brewer M.T., Thompson R.C., Moscatelli D., Presta M.,

RA Rifkin D.B.;

RT "A form of human basic fibroblast growth factor with an extended

RT amino terminus";

RL Biochem. Biophys. Res. Commun. 144:543-550(1987).

RN [4]

RP SEQUENCE FROM N.A.

RX MEDLINE; 87162468.

RA Kurokawa T., Sasada R., Iwano M., Igarashi K.;

RT "Cloning and expression of cDNA encoding human basic fibroblast

RT growth factor.";

RL FEBS Lett. 213:189-194(1987).

RN [5]

RP SEQUENCE FROM N.A.

RX MEDLINE; 89184522.

RA Prats H., Kaghad M., Prats A.C., Klagsbrun M., Lelias J.M.,

RA Liauzun P., Chalou P., Tauber J.P., Amalric F., Smith J.A.,

RA Caput D.;

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RT initiated by alternative CUG codons.";

RL Proc. Natl. Acad. Sci. U.S.A. 86:1836-1840(1989).

RN [6]

RP SEQUENCE OF 10-35.

RX MEDLINE; 86275260.

RA Gautschi P., Frater-Schroeder M., Boehlen P.;

RT "Partial molecular characterization of endothelial cell mitogens from

RT human brain: acidic and basic fibroblast growth factors.";

RL FEBS Lett. 204:203-207(1986).

RN [7]

RP SEQUENCE OF 10-39.

RX MEDLINE; 86186784.

RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;

RT "Human brain-derived acidic and basic fibroblast growth factors:

RT amino terminal sequences and specific mitogenic activities.";

RL Biochem. Biophys. Res. Commun. 135:541-548(1986).

RN [8]

RP SEQUENCE OF 2-22.



RX MEDLINE; 87156586.  
RA Story M.T., Esch F., Shimasaki S., Sasse J., Jacobs S.C., Lawson R.K.;  
RT "Amino-terminal sequence of a large form of basic fibroblast growth  
RL factor isolated from human benign prostatic hyperplastic tissue.";  
RN Biochem. Biophys. Res. Commun. 142:702-709(1987).  
RX X-RAY CRYSTALLOGRAPHY (2.2 ANGSTROMS).  
RX MEDLINE; 91195367.  
RA Eriksson A.E., Cousins L.S., Weaver L.H., Matthews B.W.;  
RT "Three-dimensional structure of human basic fibroblast growth  
RL factor.";  
RN Proc. Natl. Acad. Sci. U.S.A. 88:3441-3445(1991).  
RX X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).  
RX MEDLINE; 94004464.  
RA Eriksson A.E., Cousins L.S., Matthews B.W.;  
RT "Refinement of the structure of human basic fibroblast growth factor  
RL at 1.6-A resolution and analysis of presumed heparin binding sites by  
RN selenate substitution.";  
RX Protein Sci. 2:1274-1284(1993).  
RX X-RAY CRYSTALLOGRAPHY (1.8 ANGSTROMS).  
RX MEDLINE; 91195368.  
RA Zhang J., Cousins L.S., Barr P.J., Sprang S.R.;  
RT "Three-dimensional structure of human basic fibroblast growth factor,  
RL a structural homolog of interleukin 1 beta.";  
RN Proc. Natl. Acad. Sci. U.S.A. 88:3446-3451(1991).  
RX X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).  
RX MEDLINE; 92121151.  
RA Ago H., Kitagawa Y., Fujishima A., Matsura Y., Katsube Y.;  
RT "Crystal structure of basic fibroblast growth factor at 1.6-A  
RN resolution.";  
RX J. Biochem. 110:360-363(1991).  
RX X-RAY CRYSTALLOGRAPHY (2.8 ANGSTROMS).  
RX MEDLINE; 91095983.  
RA Zhu X., Komiya H., Chirino A., Faham S., Fox G.M., Arakawa T.,  
RN Hsu B.T., Rees D.C.;  
RT "Three-dimensional structures of acidic and basic fibroblast growth  
RL factors.";  
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RX STRUCTURE BY NMR.  
RX MEDLINE; 97040521.  
RA Moy F.J., Seddon A.P., Boehlen P., Powers R.;  
RT "High-resolution solution structure of basic fibroblast growth factor  
RN determined by multidimensional heteronuclear magnetic resonance  
spectroscopy.";  
RX Biochemistry 35:13552-13561(1996).  
CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -1- SUBUNIT: MONOMER.  
CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES  
CC AFGF.  
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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CC  
CC EMBL; M17599; AAA52534.1; ALT\_INIT.  
CC EMBL; X04431; CAA28027.1; -  
CC EMBL; X04432; CAA28028.1; -  
CC EMBL; X04433; CAA28029.1; -  
CC EMBL; M27968; AAA52448.1; -  
CC EMBL; J04513; AAA52533.1; ALT\_INIT.

DR PIR; A25824; A25824.  
DR PIR; A26642; A26642.  
DR PIR; B24243; B24243.  
DR PIR; B24301; B24301.  
DR PIR; B32878; B32878.  
DR PIR; S00297; S00297.  
DR PDB; 2FGF; 15-APR-92.  
DR PDB; 4FGF; 15-JUL-93.  
DR PDB; 1FGA; 15-JUL-93.  
DR PDB; 1BFB; 03-APR-96.  
DR PDB; 1BFC; 03-APR-96.  
DR PDB; 1BFF; 16-JUN-97.  
DR PDB; 1BFG; 31-JAN-94.  
DR PDB; 2BFH; 30-APR-94.  
DR PDB; 1BLA; 08-NOV-96.  
DR PDB; 1BLD; 08-NOV-96.  
DR MIM; 134920; -  
DR PFAM; PF00167; FGF; 1.  
DR PRINTS; PR00262; IL1HBGF.  
DR PRINTS; PR00263; HBGF.FGF.  
DR PROSITE; PS00247; HBGF.FGF; 1.  
KW Growth factor; Mitogen; Vascularization; Heparin-binding;  
KW 3D-structure. 1 9  
FT PROPEP 10 155  
FT CHAIN 10 155  
FT SITE 46 48  
FT SITE 88 90  
FT BINDING 27 31  
FT BINDING 116 119  
FT STRAND 30 34  
FT TURN 35 38  
FT STRAND 39 43  
FT TURN 45 46  
FT TURN 45 46  
FT STRAND 49 52  
FT TURN 55 56  
FT TURN 58 60  
FT STRAND 62 66  
FT TURN 69 70  
FT STRAND 71 76  
FT TURN 77 80  
FT STRAND 81 85  
FT TURN 87 88  
FT STRAND 91 94  
FT HELIX 99 101  
FT STRAND 103 107  
FT TURN 109 110  
FT STRAND 113 117  
FT TURN 121 122  
FT STRAND 124 124  
FT STRAND 127 127  
FT TURN 129 130  
FT STRAND 132 133  
FT HELIX 136 138  
FT TURN 141 142  
FT HELIX 144 146  
FT STRAND 148 152  
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Query Match 35.3%; Score 509; DB 1; Length 155;  
Best Local Similarity 54.5%; Pred. No. 4.42e-97;  
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;  
Db 24 GHFKDPKRLYCKNGGFLRHPDGRVGVREKSDPHIKLQLOAEERGVSIVKGVCANRYL 83  
QY 66 ANYKPKRLYCKNGGFLRHPDGRVGVREKSDPHIKLQLOAEERGVSIVKGVCANRYL 125  
Db 84 AKNEKEDRLASKCVTDECFERLESNNNTYRSRYT--SWYALKRTGVYKLGSKTGP 141  
QY 126 AMDTDCGLLYCSQTPNEECLEFLERLEENHYTISSKHAENFVGLKNGSKGRPTHY 185  
Db 142 GQKAILFLPNSAKS 155  
QY 186 GQKAILFLPVS 199

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RESULT 11
ID FGF2_MOUSE STANDARD; PRT; 154 AA.
AC P15655;
DT 01-APR-1990 (Rel. 14, Created)
DT 01-APR-1990 (Rel. 14, Last sequence update)
DT 01-FEB-1996 (Rel. 33, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).
DE FGF2 OR FGF-2.
GN Mus musculus (Mouse).
OS Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 90201563.
RA Hebert J.N., Basilio C., Goldfarb M., Haub O., Martin G.R.;
RT "Isolation of cDNAs encoding four mouse FGF family members and
RT characterization of their expression patterns during embryogenesis.";
Dev. Biol. 138:454-463(1990).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC AFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
CC
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CC
CC EMBL; M30644; AAA37621.1; -
CC PIR; C37360; C37360.
CC MGD; MGI:95516; FGF2.
CC PFAM; PF00167; FGF; 1.
CC PRINTS; PR00262; IL1HBGF.
CC PRINTS; PR00263; HBGFEGF.
CC PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
CC
CC PROPEP 1 9
CC CHAIN 10 154 HEPARIN-BINDING GROWTH FACTOR 2.
CC BINDING 26 30 HEPARIN (POTENTIAL).
CC BINDING 115 118 HEPARIN (POTENTIAL).
CC SEQUENCE 154 AA; 17153 MW; 689F677416274388 CRC64;
CC
Query Match 35.2%; Score 508; DB 1; Length 154;
Best Local Similarity 54.5%; Pred. No. 7.97e-97;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;
Db 23 GHFKDPKRLCYKNGFFLRHPDGRVDGVREKSDPHVKLQLOAERGVSIVKGCANYL 82
QY :::: || || || || || || || || || || || || || || || || || :
66 ANYKKPKLLCYSGNGFFLRHPDGRVDGTRDSQHIQLQSAESVGEVYIKSTGQYL 125
QY :::: || || || || || || || || || || || || || || || || || :
Db 83 ANKEDGRLLASCVTEECFFERLESNNYVRSKYS--SNVVALKRTGQVYKLGSKTGP 140
QY :||| || || || || || || || || || || || || || || || || || :
126 AMDTGLYGSOTPNEECLFLERLEENHYNTISKHAKNFWVLKKNKSGCKRGPRTHY 185
QY :||| || || || || || || || || || || || || || || || || || :
Db 141 GKAILFLPMSAKS 154
QY :||| || || || || :
186 GKAILFLPLPVSS 199
QY :||| || || || || :
RESULT 12
ID FGF2_RAT STANDARD; PRT; 154 AA.
AC P13109;
DT 01-JAN-1990 (Rel. 13, Created)
DT 01-JAN-1990 (Rel. 13, Last sequence update)
DT 15-JUL-1998 (Rel. 36, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).
DE FGF2 OR FGF-2.
GN Rattus norvegicus (Rat).
OS Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.
RN [1]
RP SEQUENCE FROM N.A.
RX STRAIN=SPRAGUE-DAWLEY; TISSUE=OVARY;
RX MEDLINE; 89061721.
RA Shimasaki S., Emoto N., Koba A., Mercado M., Shibata F.,
RA Cooksey K., Baird A., Ling N.;
RT "Complementary DNA cloning and sequencing of rat ovarian basic
RT fibroblast growth factor and tissue distribution study of its mRNA.";
RL Biochem. Biophys. Res. Commun. 157:256-263(1988).
RN [2]
RP SEQUENCE FROM N.A.
RX TISSUE=BRAIN;
RX MEDLINE; 88262516.
RA Kurokawa T., Seno M., Igarashi K.;
RT "Nucleotide sequence of rat basic fibroblast growth factor cDNA.";
RL Nucleic Acids Res. 16:5201-5201(1988).
RN [3]
RP SEQUENCE OF 1-28 FROM N.A.
RX STRAIN=SPRAGUE-DAWLEY; TISSUE=TESTIS;
RX MEDLINE; 97200905.
RA Pasumarthi K.B.S., Jin Y., Cattini P.A.;
RT "Cloning of the rat fibroblast growth factor-2 promoter region and
RT its response to mitogenic stimuli in glioma C6 cells.";
RL J. Neurochem. 68:898-908(1997).
RN [4]
RP SEQUENCE OF 35-154 FROM N.A.
RX STRAIN=SPRAGUE-DAWLEY; TISSUE=BRAIN;
RX MEDLINE; 92329546.
RA El-Husseini A.E.D., Paterson J.A., Myal Y., Shiu R.P.C.;
RT "PCR detection of the rat brain basic fibroblast growth factor (bFGF)
RT mRNA containing a unique 3' untranslated region.";
RL Biochim. Biophys. Acta 1131:314-316(1992).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- TISSUE SPECIFICITY: FOUND IN ALL THE TISSUES EXAMINED.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC AFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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CC EMBL; M22427; AAA41210.1; -
CC EMBL; X07285; CAA30265.1; -
CC EMBL; U78079; AAC53225.1; -
CC EMBL; X61697; CAA43863.1; -
CC PIR; S00876; S00876.
CC PIR; A31674; A31674.
CC HSSP; P09038; 1BFF.
CC PFAM; PF00167; FGF; 1.
CC PRINTS; PR00262; IL1HBGF.
CC PRINTS; PR00263; HBGFEGF.
CC PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
CC
CC PROPEP 1 9
CC CHAIN 10 154 HEPARIN-BINDING GROWTH FACTOR 2.
CC BINDING 26 30 HEPARIN (POTENTIAL).
CC BINDING 115 118 HEPARIN (POTENTIAL).
CC SEQUENCE 154 AA; 17153 MW; 689F677416274388 CRC64;
CC
Query Match 35.2%; Score 508; DB 1; Length 154;
Best Local Similarity 54.5%; Pred. No. 7.97e-97;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;
Db 23 GHFKDPKRLCYKNGFFLRHPDGRVDGVREKSDPHVKLQLOAERGVSIVKGCANYL 82
QY :::: || || || || || || || || || || || || || || || || || :
66 ANYKKPKLLCYSGNGFFLRHPDGRVDGTRDSQHIQLQSAESVGEVYIKSTGQYL 125
QY :::: || || || || || || || || || || || || || || || || || :
Db 83 ANKEDGRLLASCVTEECFFERLESNNYVRSKYS--SNVVALKRTGQVYKLGSKTGP 140
QY :||| || || || || || || || || || || || || || || || || || :
126 AMDTGLYGSOTPNEECLFLERLEENHYNTISKHAKNFWVLKKNKSGCKRGPRTHY 185
QY :||| || || || || || || || || || || || || || || || || || :
Db 141 GKAILFLPMSAKS 154
QY :||| || || || || :
186 GKAILFLPLPVSS 199
QY :||| || || || || :

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FT BINDING 26 30 HEPARIN (POTENTIAL).
FT BINDING 115 118 HEPARIN (POTENTIAL).
SQ SEQUENCE 154 AA; 17139 MW; 1A0F14FF423D8403 CRC64;

Query Match 35.28; Score 508; DB 1; Length 154;
Best Local Similarity 54.5%; Pred. No. 7.97e-97;
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QY 66 ANTKPKLLYCSNGGHFLRLPDGTVDGTRDSQHLQLSAESVGEVIKSTETGOYL 125
Db 83 AMKEDGRLLASKVTECFEFLERLESNNYTYRSKYS--SWYVALKRTGOYKLGSKTGP 140
QY 126 AMDTGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCRGRPTHY 185
Db 141 GOKAILFLPMSAKS 154
QY 186 GOKAILFLPLPVSS 199

RESULT 13
ID FGF2_MONDO STANDARD; PRT; 156 AA.
AC F48798;
DT 01-FEB-1996 (Rel. 33, Created)
DT 01-FEB-1996 (Rel. 33, Last sequence update)
DT 01-NOV-1997 (Rel. 35, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF) (PROSTATROPIN).
GN FGF2.
OS Monodelphis domestica (Short-tailed grey opossum).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Metatheria; Didelphimorphia; Didelphidae; Monodelphis.
RN [1]
RP SEQUENCE FROM N.A.
RC TISSUE-EYE;
RX MEDLINE; 94296558.
RA Kusewitt D.F., Sabourin C.L.K., Sherburn T.E., Ley R.D.;
RT "Characterization of cDNA encoding basic fibroblast growth factor of the marsupial Monodelphis domestica.";
RL DNA Cell Biol. 13:549-554(1994).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES AFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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CC EMBL; Z15154; CAA78854.1; ALT_INIT.
DR HSSP; P09038; 1BFF.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00262; ILLHBGF.
DR PRINTS; PR00263; HBGFPGF.
DR PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 9 BY SIMILARITY.
FT CHAIN 10 156 HEPARIN-BINDING GROWTH FACTOR 2.
FT BINDING 28 32 HEPARIN (POTENTIAL).
FT BINDING 117 120 HEPARIN (POTENTIAL).
SQ SEQUENCE 156 AA; 17303 MW; 7E655FCC49BF1209 CRC64;

Query Match 34.5%; Score 498; DB 1; Length 156;
Best Local Similarity 54.5%; Pred. No. 2.85e-94;
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Matches 73; Conservative 22; Mismatches 37; Indels 2; Gaps 1;

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QY 66 ANTKPKLLYCSNGGHFLRLPDGTVDGTRDSQHLQLSAESVGEVIKSTETGOYL 125
Db 85 AMKEDGRLLALKVYTBCEFFERLESNNYTYRSKYS--NWYVALKRTGOYKLGSKTGP 142
QY 126 AMDTGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCRGRPTHY 185
Db 143 GOKAILFLPMSAKS 156
QY 186 GOKAILFLPLPVSS 199

RESULT 14
ID FGF2_XENLA STANDARD; PRT; 155 AA.
AC P12226;
DT 01-OCT-1989 (Rel. 12, Created)
DT 01-JAN-1990 (Rel. 13, Last sequence update)
DT 01-NOV-1997 (Rel. 35, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF).
GN FGF2 OR FGF-2.
OS Xenopus laevis (African clawed frog).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Amphibia; Batrachia; Anura; Mesobatrachia; Pipoidae; Pipidae; Xenopodinae; Xenopus.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 89058621.
RA Kimelman D., Abraham J., Haaparanta T., Palisi T., Kirschner M.;
RT "The presence of fibroblast growth factor in the frog egg: its role as a natural mesoderm inducer.";
RL Science 242:1053-1056(1988).
RN [2]
RP SEQUENCE OF 95-155 FROM N.A.
RX MEDLINE; 88052890.
RA Kimelman D., Kirschner M.;
RT "Synergistic induction of mesoderm by FGF and TGF-beta and the identification of an mRNA coding for FGF in the early Xenopus embryo.";
RL Cell 51:869-877(1987).
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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CC EMBL; M18067; AAA49736.1; -.
DR PIR; A29618; A29618.
DR PIR; A40117; A40117.
DR HSSP; P09038; 1BFF.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00262; ILLHBGF.
DR PRINTS; PR00263; HBGFPGF.
DR PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 9
FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.
FT BINDING 27 31 HEPARIN (POTENTIAL).
FT BINDING 116 119 HEPARIN (POTENTIAL).
FT CONFLICT 111 111 MISSING (IN REF. 2).
SQ SEQUENCE 155 AA; 17241 MW; 036735C8063142FD CRC64;

Query Match 34.2%; Score 493; DB 1; Length 155;
Best Local Similarity 50.7%; Pred. No. 5.38e-93;
Matches 74; Conservative 27; Mismatches 43; Indels 2; Gaps 1;
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Search completed: Tue Aug 29 15:50:05 2000  
Job time : 56 secs.

RESULT	15	STANDARD;	PRT;	137	AA.
ID	FGF2/RABIT				
AC	P48799;				
DT	01-FEB-1996 (Rel. 33, Created)				
DT	01-FEB-1996 (Rel. 33, Last sequence update)				
DT	01-FEB-1996 (Rel. 33, Last annotation update)				
DT	HEPARIN-BINDING GROWTH FACTOR 2 (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF) (PROSTATROPIN) (FRAGMENT).				
GN	FGF2.				
OS	Oryctolagus cuniculus (Rabbit).				
OC	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;				
OC	Mammalia; Eutheria; Lagomorpha; Leporidae; Oryctolagus.				
RN	[1]				
RP	SEQUENCE FROM N.A.				
RC	STRAIN-NEW ZEALAND WHITE; TISSUE-SMOOTH MUSCLE;				
RX	MEDLINE; 93343209.				
RA	Winkles J.A., Friesel R., Alberts G.F., Janat M.F., Liu G.;				
RT	"Elevated expression of basic fibroblast growth factor in an				
RT	immortalized rabbit smooth muscle cell line.";				
RL	Am. J. Pathol. 143:518-527(1993).				
CC	-1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS				
CC	IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN				
CC	VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND				
CC	CONCENTRATION OF THESE 2 GROWTH FACTORS.				
CC	-1- SUBUNIT: MONOMER.				
CC	-1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES				
CC	AFGF.				
CC	-1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.				
CC	THIS SWISS-PROT entry is copyright. It is produced through a collaboration				
CC	between the Swiss Institute of Bioinformatics and the EMBL outstation -				
CC	the European Bioinformatics Institute. There are no restrictions on its				
CC	use by non-profit institutions as long as its content is in no way				
CC	modified and this statement is not removed. Usage 'by' and for commercial				
CC	entities requires a license agreement (See <a href="http://www.isb-sib.ch/announce/">http://www.isb-sib.ch/announce/</a> )				
CC	or send an email to <a href="mailto:license@isb-sib.ch">license@isb-sib.ch</a> .				
DR	EMBL; L12034; AAA31248.1; -				
DR	HSP; P09038; 1BF6.				
DR	PFAM; PF00167; FGF; 1.				
DR	PROSITE; PS00247; HBGF_FGF; 1.				
KW	Growth factor; Mitogen; Vascularization; Heparin-binding.				
FT	BINDING 18 22				
FT	BINDING 107 110				
FT	BINDING 137 137				
FT	NON_TER 137				
FT	SEQUENCE 137 AA; 15418 MW; 0D9E457B88E8C51 CRC64;				
Query Match	32.3%;				
Best Local Similarity	54.4%;				
Matches	68; Conservative				
	21; Mismatches 34; Indels 2; Gaps 1;				
Db	15 GHFKDPRKLYCKNGGFFLRIHPDGRVDCGRREKSDPHIKLQQAEEGVVSIKGVCANRLY 74				
Qy	66 ANYKKPKLLYCSNGGHFURLPDGVTDCRDRSDPHIQLSAESVGEVIYKSTGTGYL 125				
Db	75 AMKEDGRLLASKVCTDECFERLESNNYNYRSKYS--SWYVALKRTGYKLGSKTGP 132				
Qy	126 AMDVDGLLYGSQTPNECLFLERLEENHYNTYISKKAENKWFVGLKNGSKCKRGPRTHY 185				
Db	133 GQKAI 137				

(TM)

Result No.	Query			Length	DB	ID	Description	Pred. No.
	Score	Match						
1	511	35.4	130	6	077767	BASIC FIBROBLAST GROWTH	1.91e-10	
2	509	35.3	196	4	P78403	21 KD BASIC FIBROBLAST	6.40e-10	
3	382	26.5	101	13	P79706	BASIC FGF (FRAGMENT)	5.01e-67	
4	346	24.0	146	13	Q07659	FIBROBLAST GROWTH FACT	6.50e-58	
5	313	21.7	115	11	Q60487	BASIC FIBROBLAST GROWTH	1.13e-49	
6	305	21.2	212	13	Q42407	FIBROBLAST GROWTH FACT	1.07e-47	
7	301	20.9	194	6	P79130	KERATINOCYTE GROWTH FA	1.04e-46	
8	274	19.0	252	11	Q89036	FHF-4B	4.11e-40	
9	268	18.6	198	11	Q35988	RYUDOCAN CORE PROTEIN	1.16e-38	
10	265	18.4	59	4	Q16089	FIBROBLAST GROWTH	6.15e-38	
11	266	18.4	60	4	Q16588	ACIDIC FIBROBLAST GROW	3.53e-38	
12	264	18.3	70	11	Q54837	FIBROBLAST GROWTH FACT	1.07e-37	
13	260	18.0	196	13	Q9YH31	POTATIVE FIBROBLAST GR	9.79e-37	
14	256	17.8	206	13	Q9YGD8	FIBROBLAST GROWTH FACT	8.90e-36	
15	257	17.8	243	13	Q9W6A1	FIBROBLAST GROWTH FACT	5.13e-36	
16	251	17.4	127	4	Q99517	FIBROBLAST GROWTH FACT	1.39e-34	
17	248	17.2	192	4	Q95830	FIBROBLAST GROWTH FACT	7.21e-34	
18	248	17.2	245	13	Q9W6A2	FIBROBLAST GROWTH FACT	7.21e-34	
19	236	16.4	400	7	P79925	FIBROBLAST GROWTH FACT	4.97e-31	
20	226	15.7	425	5	Q076831	LET-756 PROTEIN	1.09e-28	

RESULTS 2  
ID P78443  
PREF. JOURNAL: PRT. 196 AA

```
AC P78443;
DT 01-MAY-1997 (TREMBlrel. 03, Created)
DT 01-MAY-1997 (TREMBlrel. 03, Last sequence update)
DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)
DT 21-KD BASIC FIBROBLAST GROWTH FACTOR (BFGF).
DN FGF2.
GE Homo sapiens (Human).
OS Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Primates; Catarrhini; Hominidae; Homo.
OC [1]
RN SEQUENCE FROM N.A.
RX MEDLINE: 89184522.
RA PRATS H., KAGHAD M., PRATS A.C., KLAGSRUN M., LELIAS J.M., CAPUT D.;
RA LIAZUN P., CHALON P., TAUBER J.P., AMALRIC F., SMITH J.A., CAPUT D.;
RT "High molecular mass forms of basic fibroblast growth factor are
RT initiated by alternative CUG codons."
RL Proc. Natl. Acad. Sci. U.S.A. 86:1836-1840(1989).
RN [2]
RN SEQUENCE OF 81-168 FROM N.A.
RN MEDLINE: 93038590.
RA WATSON R., ANTHONY F., PICKETT M., LAMBEN P., MASSON G.M.,
RA THOMAS E.J.;
RT "Reverse transcription with nested polymerase chain reaction shows
RT expression of basic fibroblast growth factor transcripts in human
RT granulosa and cumulus cells from in vitro fertilisation patients."
RL Biochem. Biophys. Res. Commun. 187:1227-1231(1992).
DR EMBL: J04513; AAA52532.1; -.
DR EMBL: S47380; AAD13853.1; -.
DR HSSP: P09038; 1BFF.
DR PROSITE: PS00247; HBGF_FGF; 1.
DR PFAM: PF00167; FGF; 1.
DR PRINTS: PR00262; IL1HBGF.
DR PRINTS: PR00263; HBGF_FGF.
DR SEQUENCE 196 AA; 21203 MW; 49875839 CRC32;
RN [1]
Query Match 35.3%; Score 509; DB 4; Length 196;
Best Local Similarity 54.5%; Pred. No. 6.40e-100;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

Db 65 GHFKDFKRLCYKNGGFFLRHIDGRVDGVREKSDPHIKLQQAERGVSIVKGCANRYL 124
QY ANVKPKLLCYCSNGGHFLRILPDGTGTRDRSDQHIQLQLSAESVGEVIKSTETGGYL 125
Db 125 AMKEDGRLLASCKVDCDEFFERLESNNYTYRSKYT--SNYVALKRTGQYKLSKTPG 182
QY 126 AMDTDGLLYGSGTNPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPRTHY 185
183 GKAILFLPMSAKS 196
186 GKAILFLPLPVSS 199

RESULT 3
ID P79706 PRELIMINARY; PRT; 101 AA.
AC P79706;
DT 01-MAY-1997 (TREMBlrel. 03, Created)
DT 01-MAY-1997 (TREMBlrel. 03, Last sequence update)
DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)
DE BASIC FGF (FRAGMENT).
OS Cynops pyrrhogaster (Japanese common newt).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Amphibia;
OC Batrachia; Caudata; Salamandroidea; Salamandridae; Cynops.
RN [1]
RN SEQUENCE FROM N.A.
RN TISSUE=EMBRYO;
RA SUZUKI A.S., TABATA T., SARAGUCHI K., TAKABATAKE T., TAKESHIMA K.,
RA KANEDA T.;
RT "Serial expression of the genes in a mesodermalizing ectoderms of
RT early Cynops gastrula."
RL Submitted (NOV-1996) to the EMBL/GenBank/DDBJ databases.
DR EMBL: D89443; BAA13958.1; -.
DR HSSP: P09038; 2BFF.
DR PROSITE: PS00247; HBGF_FGF; 1.

DR PFAM: PF00167; FGF; 1.
FT NON_TER 1
FT NON_TER 101
SQ SEQUENCE 101 AA; 11907 MW; 1CD93BBO CRC32;

Query Match 26.5%; Score 382; DB 13; Length 101;
Best Local Similarity 53.4%; Pred. No. 5.01e-67;
Matches 55; Conservative 18; Mismatches 28; Indels 2; Gaps 1;

Db 1 PKRLCYKNGGFFLRINSDGKVDGAREKSDSYIKLQQAERGVSIVKGCANRYLAMKDD 60
QY 71 PKLLCYCSNGGHFLRILPDGTGTRDRSDQHIQLQLSAESVGEVIKSTETGGYAMD 130
Db 61 GRMLAKWIIDCEFFERLESNNYTYRSKYSD--WYVALKR 101
QY 131 GLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKK 173

RESULT 4
ID Q07659 PRELIMINARY; PRT; 146 AA.
AC Q07659;
DT 01-NOV-1996 (TREMBlrel. 01, Created)
DT 01-NOV-1996 (TREMBlrel. 01, Last sequence update)
DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)
DE FIBROBLAST GROWTH FACTOR.
GN BFGF.
OS Gallus gallus (Chicken).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;
OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.
RN [1]
RN SEQUENCE FROM N.A.
RX MEDLINE: 93246053.
RA BORJA A.Z., ZELLER R., MEIJERS C.;
RT "Expression of alternatively spliced bFGF first coding exons and
RT antisense mRNAs during chicken embryogenesis."
RL Dev. Biol. 157:110-118(1993).
RN [2]
RN SEQUENCE OF 52-85 FROM N.A.
RX MEDLINE: 90382254.
RA MITRANI E., GRUNBAUM Y., SHOHAT H., ZIV T.;
RT "Fibroblast growth factor during mesoderm induction in the early chick
RT embryo."
RL Development 109:387-393(1990).
DR EMBL: M95706; AAA48616.1; -.
DR EMBL: X58804; CAA40139.1; -.
DR HSSP: P09038; 2BFF.
DR PROSITE: PS00247; HBGF_FGF; 1.
DR PFAM: PF00167; FGF; 1.
DR PRINTS: PR00262; IL1HBGF.
DR SEQUENCE 146 AA; 16182 MW; 44C5274B CRC32;

Query Match 24.0%; Score 346; DB 13; Length 146;
Best Local Similarity 48.1%; Pred. No. 6.50e-58;
Matches 50; Conservative 20; Mismatches 32; Indels 2; Gaps 1;

Db 45 ERVSAMVKLQQAERGVSIVKGSANFLAMKEDGRLLKALCKATEECFFERLESNNYN 104
QY 96 DRSDQHIQLQLSAESVGEVIKSTETGQYLAAMDGLLYGSGTNPNEECFLERLEENHYN 155
Db 105 TYRSKYSD--WYVALKRTGQYKPGKTPGQKAILFLPMSAKS 146
QY 156 TYISKHAEKNWFVGLKNGSKRGPRTHYGGKAILFLPLPVSS 199

RESULT 5
ID Q60487 PRELIMINARY; PRT; 115 AA.
AC Q60487;
DT 01-NOV-1996 (TREMBlrel. 01, Created)
DT 01-NOV-1996 (TREMBlrel. 01, Last sequence update)
DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)
DE BASIC FIBROBLAST GROWTH FACTOR (FRAGMENT).
OS Cavia porcellus (Guinea pig).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
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QY 74 LYCSNGHFLRILPDGTDRSDQHIQLQLSAESGEVYIKSTETQYALMDTDGILL 133
Db 139 YPSELFTECKFKESFENYVYISMLYRQESGRANFLGNKGQVKNRYKTKTPA 198
QY 134 YGSQTPNEECLEFLRLEENHYTISK--KHAEE--KNMFVGLKNGSKRGRTHYGOKA 189
Db 199 AHFLPKPL 206
QY 190 ILFLPLPV 197

RESULT 9
ID Q35988 PRELIMINARY; PRT; 198 AA.
AC Q35988;
DT 01-JAN-1998 (TREMBLrel. 05, Created)
DT 01-JAN-1998 (TREMBLrel. 05, Last sequence update)
DE RYUDOCAN CORE PROTEIN PRECURSOR.
OS Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
RN [1]
RP SEQUENCE FROM N.A.
RC STRAIN-C3H/AN, AND 129SVJ;
RX MEDLINE: 97420681.
RA TSUZUKI S., KOJIMA T., KATSUMI A., YAMAZAKI T., SUGIURA I., SAITO H.;
RT "Molecular cloning, genomic organization, promoter activity, and
RT tissue-specific expression of the mouse ryudocan gene.";
RL J. Biochem. 122:17-24(1997).
CC -!- FUNCTION: CELL SURFACE PROTEOGLYCAN THAT BEARS BOTH HEPARAN
CC SULFATE AND CHONDROITIN SULFATE AND THAT LINKS THE CYTOSKELETON TO
CC THE INTERSTITIAL MATRIX. BINDS BASIC FIBROBLAST GROWTH FACTOR.
DR EMBL; D89571; BAA22135.1; -.
DR EMBL; D89572; BAA22136.1; -.
DR PROSITE; P500964; SYNDECAN; 1.
DR PFAM; PF01034; Syndecan; 1.
KW Signal; Proteoglycan; Heparan sulfate; Transmembrane; Glycoprotein.
FT SIGNAL 1 23 POTENTIAL.
FT CHAIN 24 198 POTENTIAL.
SQ SEQUENCE 198 AA; 21482 MW; FC67B0E5 CRC32;

Query Match 18.6%; Score 268; DB 11; Length 198;
Best Local Similarity 77.1%; Pred. No. 1.16e-38;
Matches 54; Conservative 5; Mismatches 2; Indels 9; Gaps 6;

Db 1 MAPACLLAPLLLLLGGFFLVPGESIRETEVIDPDQLLEGRYFSGALPDDEDA-G-G--S 56
1 MAPARLFA-LLLFFVGG----VA-ESIRETEVIDPDQLLEGRYFSGALPDDEVDVGGQES 55
57 DDFELSGSD 66
58 DDFELSGSD 65

QY 56 DDFELSGSD 65

RESULT 10
ID Q16089 PRELIMINARY; PRT; 59 AA.
AC Q16089;
DT 01-NOV-1996 (TREMBLrel. 01, Created)
DT 01-NOV-1996 (TREMBLrel. 01, Last sequence update)
DE ACIDIC FIBROBLAST GROWTH FACTOR (FRAGMENT).
OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Primates; Catarrhini; Hominidae; Homo.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE: 94069734.
RA ZHAO X.M., YEOP T.K., HIEBERT M., FRIST W.H., MILLER G.G.;
RT "The expression of acidic fibroblast growth factor (heparin-binding
RT growth factor-1) and cytokine genes in human cardiac allografts and T
RT cells.";
RL Transplantation 56:1177-1182(1993).
DR EMBL; S67294; AAB29059.1; -.

QY 56 DDFELSGSD 65
```

```
DR HSSP; P05230; 2AXM.
DR PRAM; PF00167; FGF; 1.
FT NON_TER 59
SQ SEQUENCE 59 AA; 6595 MW; 1C932B1D CRC32;

Query Match 18.4%; Score 265; DB 4; Length 59;
Best Local Similarity 80.9%; Pred. No. 6.15e-38;
Matches 38; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 13 TEKNLPG--NYKKPKLLYCSNGHFLRILPDGTVDGTRDRSDQH 56
55 SDFELSGSDANYKKPKLLYCSNGHFLRILPDGTVDGTRDRSDQH 101

RESULT 11
ID Q16588 PRELIMINARY; PRT; 60 AA.
AC Q16588;
DT 01-NOV-1996 (TREMBLrel. 01, Created)
DT 01-NOV-1996 (TREMBLrel. 01, Last sequence update)
DE ACIDIC FIBROBLAST GROWTH FACTOR (FRAGMENT).
OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Primates; Catarrhini; Hominidae; Homo.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE: 94069734.
RA ZHAO X.M., YEOP T.K., HIEBERT M., FRIST W.H., MILLER G.G.;
RT "The expression of acidic fibroblast growth factor (heparin-binding
RT growth factor-1) and cytokine genes in human cardiac allografts and T
RT cells.";
RL Transplantation 56:1177-1182(1993).
RN [2]
RP SEQUENCE FROM N.A.
RX MEDLINE: 92202857.
RA LI Y.L., KHA H., GOLDEN J.A., MICCHIELSEN A.A.J., GOETZL E.J.,
RA TURCK E.J.;
RT "An acidic fibroblast growth factor protein generated by alternate
RT splicing acts like an antagonist.";
RL J. Exp. Med. 175:1073-1080(1992).
DR EMBL; S67292; AAB29058.1; -.
DR EMBL; X65779; CAA46662.1; -.
DR HSSP; P05230; 2AXM.
DR PRAM; PF00167; FGF; 1.
FT NON_TER 60
SQ SEQUENCE 60 AA; 6697 MW; 6CC7DFF CRC32;

Query Match 18.4%; Score 266; DB 4; Length 60;
Best Local Similarity 77.6%; Pred. No. 3.53e-38;
Matches 38; Conservative 6; Mismatches 2; Indels 3; Gaps 2;

Db 13 TEKNLPG--NYKKPKLLYCSNGHFLRILPDGTVDGTRDRSDQH 58
55 SDFELSGSDANYKKPKLLYCSNGHFLRILPDGTVDGTRDRSDQH 103

RESULT 12
ID Q54837 PRELIMINARY; PRT; 70 AA.
AC Q54837;
DT 01-JUN-1998 (TREMBLrel. 06, Created)
DT 01-JUN-1998 (TREMBLrel. 06, Last sequence update)
DE ACIDIC FIBROBLAST GROWTH FACTOR-1 (FRAGMENT).
OS Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
RN [1]
RP SEQUENCE FROM N.A.
RC STRAIN-C3H/HEN; TISSUE=LIVER;
RA ZHANG Y.-X., HACKSHAW K.V.;
RL Submitted (JUL-1997) to the EMBL/GenBank/DBJ databases.
DR EMBL; AF012926; AAB94020.1; -.
DR HSSP; P05230; 2AXM.
```



[illegible]



Result No.	Score	Query		Length	DB	ID	Description	Pred. No.
		Match	%					
1	985	68.5		154	1	W92293	Human beta-endothelial	2.14e-86
2	985	68.5		154	1	W75414	Human beta-endothelial	2.14e-86
3	985	68.5		154	1	W06816	Human endothelial cell	2.14e-86
4	985	68.5		154	1	W04805	Human beta-endothelial	2.14e-86
5	985	68.5		155	1	W75415	Human endothelial cell	2.14e-86
6	985	68.5		155	1	W75711	Fibroblast growth fact	2.14e-86
7	985	68.5		155	1	R80776	Fibroblast growth fact	2.14e-86
8	985	68.5		155	1	P70482	Sequence encoded by co	2.14e-86
9	985	68.5		155	1	P94037	Human acidic fibroblas	2.14e-86
10	985	68.5		155	1	W53022	Fibroblast growth fact	2.14e-86
11	985	68.5		155	1	R70812	FGF-1.	2.14e-86
12	985	68.5		155	1	W92291	Human endothelial cell	2.14e-86
13	985	68.5		165	1	R05785	Human bEGGF encoded by	2.14e-86
14	985	68.5		168	1	W06818	Human endothelial cell	2.14e-86
15	983	68.4		134	1	W75413	Human alpha-endothelia	3.43e-86
16	983	68.4		134	1	W92282	Human alpha-endothelia	3.43e-86
17	983	68.4		134	1	W04807	Human alpha-endothelia	3.43e-86
18	984	68.4		140	1	W04806	Human acidic fibroblas	2.71e-86
19	984	68.4		140	1	R74647	Human recombinant aFGF	2.71e-86
20	984	68.4		140	1	R34457	Human acidic Fibroblas	2.71e-86
21	984	68.4		140	1	P70995	Sequence of human prot	2.71e-86
22	984	68.4		140	1	R25914	Human acidic fibroblas	2.71e-86
23	984	68.4		140	1	P90068	Human acid fibroblast	2.71e-86

Db 129 GSKRGRPRTHYGOKAILFLPLPVSSD 154  
:::|||||  
Qy 175 GSKRGRPRTHYGOKAILFLPLPVSSD 200

## RESULT 2

ID W75414 standard; protein; 154 AA.  
AC W75414;  
DE 02-MAR-1999 (first entry)  
DE Human beta-endothelial cell growth factor.  
KW Human; endothelial cell growth factor; ECGF; brain stem; probe;  
KW hybridisation; bovine; wound healing; prosthetic device.  
OS Homo sapiens.  
PN US5827826-A.  
PD 27-OCT-1998.  
PE 04-NOV-1996; 743261.  
PR 04-NOV-1996; US-743261.  
PR 03-MAR-1986; US-835594.  
PR 18-DEC-1987; US-134499.  
PR 29-APR-1991; US-693079.  
PR 27-NOV-1991; US-799859.  
PR 03-NOV-1994; US-334884.  
PR 07-JUN-1995; US-472964.  
PA (RHON ) RHONE-POULENC RORER PHARM INC.  
PI Burgess W, Drohan WN, Jaye M, Maciag T;  
DR WPI: 98-594032/50.  
PT Compositions for promoting wound healing - containing endothelial  
PT cell growth factor polypeptides  
PS Claim 1; Column 16; 23pp; English.  
CC This sequence represents the amino acid sequence of the mature human  
CC beta-endothelial cell growth factor (b-ECGF). This amino acid sequence  
CC is identical to the alpha-ECGF but the beta sequence contains an extra  
CC 20 N-terminal amino acids. The sequence was isolated from a human brain  
CC stem cell cDNA library using a probe designed based on fragments of the  
CC bovine ECGF (see W75416-W75418). The ECGF protein can be used in  
CC compositions for promoting wound healing. ECGF is also used to grow  
CC cells on a prosthetic device.  
SQ Sequence 154 AA;

Query Match 68.5%; Score 985; DB 1; Length 154;

Best Local Similarity 93.8%; Pred. No. 2.14e-86;  
Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 12 TEKFLNP-PG--NYKKPKLLYCSNGHFLRLPDGTVDGTRDRSDQHILQLSAESVGEV 68  
:::|:|:|:|  
Qy 55 SDDFELSGSGDANYKKPKLLYCSNGHFLRLPDGTVDGTRDRSDQHILQLSAESVGEV 114

69 YIKSTETQYLAAMDYDGLLYGSQTPNEECFLERLEENHNTYISKHAEKNWVGLKKN 128  
:::|||||  
115 YIKSTETQYLAAMDYDGLLYGSQTPNEECFLERLEENHNTYISKHAEKNWVGLKKN 174

Db 129 GSKRGRPRTHYGOKAILFLPLPVSSD 154  
:::|||||  
Qy 175 GSKRGRPRTHYGOKAILFLPLPVSSD 200

## RESULT 3

ID W06816 standard; Protein; 154 AA.  
AC W06816;  
DE 17-MAR-1997 (first entry)  
DE Human endothelial cell growth factor-beta.  
KW Endothelial cell growth factor-beta; ECGF-beta.  
OS Homo sapiens.  
PN US5571790-A.  
PD 05-NOV-1996.  
PE 03-MAR-1986; 835594.  
PR 03-MAR-1986; US-835594.  
PR 18-DEC-1987; US-134499.  
PR 29-APR-1991; US-693079.  
PR 27-NOV-1991; US-799859.  
PR 03-NOV-1994; US-334884.  
PR 07-JUN-1995; US-472964.  
PA (RHON ) RHONE POULENC RORER PHARM INC.

Query Match 68.5%; Score 985; DB 1; Length 154;

Best Local Similarity 93.8%; Pred. No. 2.14e-86;  
Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

PI Burgess W, Drohan WN, Jaye M, Maciag T;  
DR WPI: 96-505421/50.  
DR N-PSDB; T45983.  
PT Recombinant human endothelial cell growth factors - for treating  
PT damaged blood vessels, etc.  
PS Claim 1; Column 16; 22pp; English.  
CC Human recombinant endothelial cell growth factors (ECGF) beta  
CC (W06816) and alpha (W06817) differ only at their N-terminal ends.  
CC They can be produced in transformed prokaryotic or eukaryotic host  
CC cells using DNA sequences (T45983 and T45984, respectively) derived  
CC from the complete human ECGF cDNA (T45985). Large quantities of  
CC the ECGFs are produced by culturing the host cells and recovering  
CC of endothelial cells in culture. They can potentially be used to  
CC treat damaged blood vessels and other endothelial cell-lined  
CC structures, and also have diagnostic applns.  
SQ Sequence 154 AA;

Query Match 68.5%; Score 985; DB 1; Length 154;

Best Local Similarity 93.8%; Pred. No. 2.14e-86;  
Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 12 TEKFLNP-PG--NYKKPKLLYCSNGHFLRLPDGTVDGTRDRSDQHILQLSAESVGEV 68  
:::|:|:|:|  
Qy 55 SDDFELSGSGDANYKKPKLLYCSNGHFLRLPDGTVDGTRDRSDQHILQLSAESVGEV 114

69 YIKSTETQYLAAMDYDGLLYGSQTPNEECFLERLEENHNTYISKHAEKNWVGLKKN 128  
:::|||||  
115 YIKSTETQYLAAMDYDGLLYGSQTPNEECFLERLEENHNTYISKHAEKNWVGLKKN 174

Db 129 GSKRGRPRTHYGOKAILFLPLPVSSD 154  
:::|||||

Qy 175 GSKRGRPRTHYGOKAILFLPLPVSSD 200

## RESULT 4

ID W04805 standard; Protein; 154 AA.

AC W04805;  
DE 29-DEC-1996 (first entry)  
DE Human beta-endothelial cell growth factor.  
KW Endothelial cell growth factor; ECGF; blood vessel; regeneration;  
KW heparin-Sepharose affinity chromatography; probe; oligonucleotide;  
KW FGF; fibroblast growth factor.  
OS Homo sapiens.  
PN US5552528-A.  
PD 03-SEP-1996.  
PE 03-MAR-1986; 835594.  
PR 03-MAR-1986; US-835594.  
PR 18-DEC-1987; US-134499.  
PR 29-APR-1991; US-693079.  
PR 27-NOV-1991; US-799859.  
PR 03-NOV-1994; US-334884.  
PA (RHON ) RHONE POULENC RORER PHARM INC.

PI Burgess W, Maciag T;  
DR WPI: 96-412132/41.  
DR N-PSDB; T37503.

PT Isolated, purified, biologically active bovine beta endothelial cell  
PT growth factor - useful to regenerate or treat damaged blood vessels  
PS Disclosure; Fig 8; 28pp; English.  
CC Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having  
CC a mol. wt. of 20 kD can be purified at least 16300 fold from bovine  
CC brain using heparin-Sepharose affinity chromatography. ECGF is  
CC useful for, among other purposes, diagnostic applications and has  
CC potential in the treatment of damaged blood vessels or other  
CC endothelial cell-lined structures.  
CC Human ECGF (T37503) or fragments may be obtained using  
CC oligonucleotides (T37504 and T37508 to T37509) whose design is based  
CC on the sequence of bovine alpha- and beta-ECGF.  
SQ Sequence 154 AA;

Query Match

Best Local Similarity 93.8%; Pred. No. 2.14e-86;

Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;



QY 175 GSKRGPRTHYGOKAILFLPLPVSSD 200  
|||||

RESULT 7  
ID R80776 standard; Protein; 155 AA.

AC R80776;  
DT 13-MAY-1996 (first entry)  
DE Fibroblast growth factor 1, FGF-1.  
KW Conjugate; fibroblast growth factor; FGF; cytotoxin; saporin; eye;  
KW cell proliferation; regulation; pterygia; corneal clouding; cancer;  
KW psoriasis; rheumatoid arthritis.  
OS Homo sapiens.  
PN W09524928-A2.  
PD 21-SEP-1995.  
PR 15-MAR-1995; U03448.  
PR 15-MAR-1994; US-213447.  
PR 15-MAR-1994; US-213446.  
PR (PRIZ-) PRIZM PHARM INC.  
DR Baird JA, Houston LL, Nova MP, Sosnowski BA;  
WPI; 95-336820/43.

PT New conjugates of growth factor receptor ligand and targetted agent  
PT - partic. DNA or cytotoxin, used to control cell proliferation in  
PT the eye, e.g. to prevent growth of pterygia and corneal clouding  
PS Claim 33; Page 140-141; 204pp; English.  
CC R80776-84 are fibroblast growth factors (FGF) FGF-1 to FGF-9  
CC respectively. DNA encoding these fibroblast growth factors can be  
CC used to create an FGF/saporin fusion protein. DNA encoding such fusion  
CC proteins are useful for targeting saporin (a cytotoxin) to a cell  
CC carrying the FGF receptor. Targetted agents (TA) other than saporin  
CC which may be used include in partic. DNA encoding a therapeutic protein,  
CC antisense DNA or other cytotoxic agent. The linker sequence within the  
CC fusion protein may increase serum stability or intracellular  
CC availability of the TA. The conjugates of the invention are used to  
CC inhibit cell proliferation in cells carrying the particular growth  
CC factor receptor; also when TA is DNA it can be used to deliver this  
CC to cells (for gene therapy). A specific application is to prevent  
CC excessive proliferation of epithelial cells, fibroblasts and  
CC keratinocytes in the anterior eye after surgery, closure of  
CC recurrence of pterygia after surgical removal, closure of  
CC trabeculectomy after glaucoma surgery and corneal clouding after  
CC excimer laser treatment. Other conditions which may be treated include  
CC tumours, restenosis, psoriasis, Dupuytren's contracture, diabetic  
CC complications, Kaposi's sarcoma and rheumatoid arthritis.  
SQ Sequence 155 AA;

Query Match 68.5%; Score 985; DB 1; Length 155;  
Best Local Similarity 93.8%; Pred. No. 2.14e-86;  
Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 13 TEKFNLP-PG--NYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHQLQLSAESVGEV 69  
: : : : :  
QY 55 SDFELSGSDGANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHQLQLSAESVGEV 114  
: : : : :  
Db 70 YIKSTETGOYLANDTDGLLYGSGTNPNECLFLERLEENHYNHTYISKHAEKNWVGLKKN 129  
: : : : :  
QY 115 YIKSTETGOYLANDTDGLLYGSGTNPNECLFLERLEENHYNHTYISKHAEKNWVGLKKN 174  
: : : : :  
Db 130 GSKRGPRTHYGOKAILFLPLPVSSD 155  
QY 175 GSKRGPRTHYGOKAILFLPLPVSSD 200  
: : : : :  
: : : : :

RESULT 8  
ID P70482 standard; Protein; 155 AA.

AC P70482;  
DT 13-MAY-1991 (first entry)  
DE Sequence encoded by complete cDNA sequence of human endothelial  
DE cell growth factor (ECGF).  
KW Endothelial cell regeneration; blood vessel regeneration.  
OS Homo sapiens.  
PN Key  
FH Key  
FT protein

Location/Qualifiers  
2 .15

FT protein  
FT /label= Beta ECGF  
FT 16.21  
FT /label= Acidic FGF  
FT 22.155  
FT /label= Alpha ECGF  
PN W08705332-A.  
PD 11-SEP-1987.  
PF 02-MAR-1987; U00425.  
PR 03-MAR-1986; US-835594.  
PR 26-MAR-1987; ES-000812.  
PA (MELO-) MELOY LAB INC.  
PA (RORE-) RORER BIOTECHN INC.  
PA (RORE-) RORER.  
PA BIOTECH INC.  
PI Jaye M, Burgess W, Maciag T, Drohan W;  
WPI; 87-264128/37.

DR N-PSDB; N70788  
PT Human endothelial cell growth factor - produced by recombinant  
PT DNA techniques, useful for wound healing  
PT Example; Fig 8; 43pp; English.  
PS To screen the human brain stem cDNA library for clones contg. ECGF  
CC inserts, a specific oligonucleotide was designed. This  
CC oligonucleotide was based upon a partial AA sequence analysis of  
CC the amino terminus of ECGF (see P70480 and P70481). Fig 3c sets  
CC forth for comparison the AA sequence of cyanogen bromide-cleaved  
CC bovine alpha and beta ECGF (P70834). The two clones that were  
CC isolated, ECGF-clones 1 and 29, were analysed in further detail. The  
CC nucleotide sequence of these clones and the AA sequence deduced from  
CC the nucleic acid sequence is shown in Fig 8 (see N70788 and P70482).  
SQ Sequence 155 AA;

Query Match 68.5%; Score 985; DB 1; Length 155;  
Best Local Similarity 93.8%; Pred. No. 2.14e-86;  
Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 13 TEKFNLP-PG--NYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHQLQLSAESVGEV 69  
: : : : :  
QY 55 SDFELSGSDGANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHQLQLSAESVGEV 114  
: : : : :  
Db 70 YIKSTETGOYLANDTDGLLYGSGTNPNECLFLERLEENHYNHTYISKHAEKNWVGLKKN 129  
: : : : :  
QY 115 YIKSTETGOYLANDTDGLLYGSGTNPNECLFLERLEENHYNHTYISKHAEKNWVGLKKN 174  
: : : : :  
Db 130 GSKRGPRTHYGOKAILFLPLPVSSD 155  
QY 175 GSKRGPRTHYGOKAILFLPLPVSSD 200  
: : : : :  
: : : : :

RESULT 9  
ID P94037 standard; protein; 155 AA.

AC P94037;  
DT 25-JUN-1990 (first entry)  
DE Human acidic fibroblast growth factor.  
DE Acidic fibroblast growth factor.  
OS Homo sapiens.  
PN EP-298723-A.  
PD 11-JAN-1989.  
PF 06-JUL-1988; 306158.  
PR 07-JUL-1987; US-070797.  
PA (BIOT-) Biotechn Res Assoc.  
PI Fiddes JC, Abraham JA, Protter A;  
WPI; 89-009785/02.  
DR N-PSDB; N93088.  
PT Recombinant DNA encoding new fibroblast growth factor  
PT analogues - useful eg for accelerating wound healing and  
PT to control neovascularisation.  
PS Disclosure; p: English.  
CC See also P94038.  
SQ Sequence 155 AA;

Query Match 68.5%; Score 985; DB 1; Length 155;  
Best Local Similarity 93.8%; Pred. No. 2.14e-86;  
Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 13 TEKNLP-PG--NYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESYGEV 69  
 QY 55 SDDFELSGSDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESYGEV 114  
 Db 70 YIKSTETGOYLANDTDGLLYGSGTPNEECFLERLEENHYNTYISKHAEKNMFVGLKKN 129  
 QY 115 YIKSTETGOYLANDTDGLLYGSGTPNEECFLERLEENHYNTYISKHAEKNMFVGLKKN 174  
 Db 130 GSKCRGPRTHYGOKAILFLPLPVSSD 155  
 QY 175 GSKCRGPRTHYGOKAILFLPLPVSSD 200

RESULT 10  
 ID W53022 standard; Protein; 155 AA.  
 AC W53022  
 DT 14-AUG-1998 (first entry)  
 DE Fibroblast growth factor protein 1.  
 KW FGF; cell growth; survival; differentiation; central nervous system;  
 OS peripheral nervous tissue; treatment; diagnosis; cell culture.  
 PI Mammalian.  
 PA WO9808864-A1.  
 PI 05-MAR-1998.  
 PR 27-AUG-1997; U15237.  
 PR 30-AUG-1996; US-705245.  
 PA (UYJO ) UNIV JOHNS HOPKINS SCHOOL MEDICINE.  
 PI Nathans J, Snailwood PM;  
 DT WPI; 98-179380/16.  
 PR New fibroblast growth factor homologous factors - useful for, e.g.  
 PT developing products for diagnosis and treatment of conditions  
 PT involving neuro-degenerative and neoplastic disorders  
 PS Disclosure; Page 50-51; 94pp; English.  
 CC Fibroblast growth factor (FGF) proteins (W53022-W53024 and W53029-W53033)  
 CC are members of the fibroblast growth factor family and have homology to  
 CC Fibroblast growth factor homologous factor (FGF) proteins. The FGF  
 CC proteins (FGF 1-4) are involved in regulating the growth, survival, and  
 CC differentiation of cells in the central nervous system, as well as cells  
 CC in peripheral nervous tissues. The proteins can therefore be used for  
 CC treating and diagnosing conditions involving the nervous system. FGF's  
 CC can also be used in methods for maintaining cultured cells or tissues or  
 CC to promote neuron growth in vitro.  
 SQ Sequence 155 AA;

Query Match 68.5%; Score 985; DB 1; Length 155;  
 Best Local Similarity 93.8%; Pred. No. 2.14e-86;  
 Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

QY 13 TEKNLP-PG--NYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESYGEV 69  
 QY 55 SDDFELSGSDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESYGEV 114  
 Db 70 YIKSTETGOYLANDTDGLLYGSGTPNEECFLERLEENHYNTYISKHAEKNMFVGLKKN 129  
 QY 115 YIKSTETGOYLANDTDGLLYGSGTPNEECFLERLEENHYNTYISKHAEKNMFVGLKKN 174  
 Db 130 GSKCRGPRTHYGOKAILFLPLPVSSD 155  
 QY 175 GSKCRGPRTHYGOKAILFLPLPVSSD 200

RESULT 11  
 ID R70812 standard; protein; 155 AA.  
 AC R70812  
 DT 01-SEP-1995 (first entry)  
 DE FGF-1.  
 KW FGF-1; fibroblast growth factor; cytotoxic conjugate; fusion protein;  
 OS saporin; cytostatic; tumor; diabetes; rheumatoid arthritis.  
 PI Homo sapiens.  
 PA Location/Qualifiers  
 FT misc\_difference 31  
 FT /note= "Cys may be replaced by Ser"  
 FT misc\_difference 132

FT WO9503831-A.  
 PN 09-FEB-1995.  
 PD 27-JUL-1994; U08511.  
 PF 02-AUG-1993; US-099924.  
 PR 29-OCT-1993; US-145829.  
 PA (PRIZ-) WHITTIER PHARM INC.  
 PA (WHIT-) WHITTIER INST DIABETES & ENDOCRINOLOGY.  
 PI Baird AJ, Lappi DA, Sosnowski BA;  
 DT WPI; 95-082038/11.  
 PR New monogenous preparations of cytotoxic conjugates and DNA -  
 PT contain fibroblast growth factors and cytotoxic agents for  
 PT treating FGF conditions such as tumours, diabetes and rheumatoid  
 PT arthritis.  
 PS Disclosure; Page 108-109; 128pp; English.  
 CC Novel fusion proteins comprise FGF linked to saporin. FGF-1 to -9  
 CC may be used, pref. FGF-1 (R70812), FGF-5 (R70813), FGF-7 (R70814) or  
 CC FGF-8 (R70815) muteins, in which at least 1 Cys residue is replaced  
 CC by conservative Ser substitutions. The fusion proteins are potent  
 CC cytotoxic agents to cells bearing the FGF receptor.  
 SQ Sequence 155 AA;

Query Match 68.5%; Score 985; DB 1; Length 155;  
 Best Local Similarity 93.8%; Pred. No. 2.14e-86;  
 Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 13 TEKNLP-PG--NYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESYGEV 69  
 QY 55 SDDFELSGSDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESYGEV 114  
 Db 70 YIKSTETGOYLANDTDGLLYGSGTPNEECFLERLEENHYNTYISKHAEKNMFVGLKKN 129  
 QY 115 YIKSTETGOYLANDTDGLLYGSGTPNEECFLERLEENHYNTYISKHAEKNMFVGLKKN 174  
 Db 130 GSKCRGPRTHYGOKAILFLPLPVSSD 155  
 QY 175 GSKCRGPRTHYGOKAILFLPLPVSSD 200

RESULT 12  
 ID W92291 standard; Protein; 155 AA.  
 AC W92291;  
 DT 20-APR-1999 (first entry)  
 DE Human endothelial cell growth factor (ECGF) protein sequence.  
 KW Endothelial cell growth factor; ECGF; cleavable; recombinant; repair;  
 KW regenerate; blood vessel; endothelial cell; human.  
 OS Homo sapiens.  
 PI Location/Qualifiers  
 FT Peptide 2  
 FT /note= "beta-ECGF begins at this position"  
 FT Peptide 16  
 FT /note= "acidic-FGF begins at this position"  
 FT Peptide 22  
 FT /note= "alph-ECGF begins at this position"  
 PN US5849538-A.  
 PD 15-DEC-1998.  
 PF 11-APR-1997; 840088.  
 PR 04-NOV-1996; US-743261.  
 PR 03-MAR-1986; US-835594.  
 PR 18-DEC-1987; US-134499.  
 PR 29-APR-1991; US-693079.  
 PR 27-NOV-1991; US-799859.  
 PR 03-NOV-1994; US-334884.  
 PR 07-JUN-1995; US-472964.  
 PR 11-APR-1997; US-840088.  
 PA (RHON ) RHONE-POULENC RORER PHARM INC.  
 PI Burgess W, Drohan WN, Jaye M, MacIag T;  
 DT WPI; 99-069734/06.  
 DR N-PSDB; X01723.  
 PT DNA encoding a cleavable signal peptide and an endothelial cell  
 PT growth factor - useful for producing recombinant endothelial cell  
 PT growth factor proteins  
 PS Disclosure; Fig 8; 23pp; English.

CC The invention relates to DNA encoding human endothelial cell growth factors (ECGF) and plasmids comprising the DNA sequences. The DNA encodes a cleavable signal peptide and an ECGF, where removal of the signal peptide yields a mature form of the ECGF, where the ECGF is alpha-ECGF or beta-ECGF. The DNA is used to produce recombinant ECGF proteins, which can be used in treatments to repair or regenerate blood vessels or other structures lined with endothelial cells. The present sequence represents a human ECGF protein (the encoding cDNA determined from lambda ECGF clones 1 and 29).

CC Sequence 155 AA;

Query Match 68.5%; Score 985; DB 1; Length 155;  
Best Local Similarity 93.8%; Pred. No. 2.14e-86;  
Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 13 TEKFNLP-PG--NYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHQLQLSAESVGEV 69  
QY 55 SDDFELSGSDANYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHQLQLSAESVGEV 114

70 YIKSTETGOYAMDTDGLLYGSQTNPNECLFLERLEENHYNTYISKHAEKNWFVGLKKN 129  
QY 115 YIKSTETGOYAMDTDGLLYGSQTNPNECLFLERLEENHYNTYISKHAEKNWFVGLKKN 174

Db 130 GSKRGPRTHYGOKAILFLPLPVSSD 155

QY 175 GSKRGPRTHYGOKAILFLPLPVSSD 200

RESULT 13

ID R05785 standard; Protein; 165 AA.

AC R05785;

DT 22-AUG-1990 (first entry)

DE Human bECGF encoded by synthetic gene.

KW Beta-endothelial cell growth factor; homeostasis;

KW atherosclerosis; tumor.

OS Synthetic.

FH Key Location/Qualifiers

FT misc\_difference 160..161

FT /note= "sites corresp. to two stop codons of

FT the DNA sequence"

PN GB2223497-A.

PD 11-APR-1990.

PF 08-AUG-1988; 018777.

PR 08-AUG-1988; GB-018777.

PA (BRI) Brit Bio-Tech Ltd.

PI Davies JA, Johnson ID;

DR WPI; 90-109883/15.

PT N-PSDB; Q03871.

CC Gene encoding human beta-endothelial cell growth factor - incorporates useful restriction sites at frequent intervals to facilitate cassette mutagenesis at selected regions.

PS Disclosure; Fig 3a; 18pp; English.

CC The synthetic bECGF gene incorporates useful restriction sites at frequent intervals to facilitate the cassette mutagenesis of selected regions. Also included are flanking sites to simplify the incorporation of the gene into any expression system.

CC bECGF is one of the factors involved in the regulation of homeostasis of blood vessels acting in part through effects on endothelial cells. Such factors may also play a role in stages of atherosclerosis and tumour growth and development.

CC Sequence 165 AA;

QY Sequence 165 AA;

Query Match 68.5%; Score 985; DB 1; Length 165;

Best Local Similarity 93.8%; Pred. No. 2.14e-86;

Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 17 TEKFNLP-PG--NYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHQLQLSAESVGEV 73  
QY 55 SDDFELSGSDANYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHQLQLSAESVGEV 114

Db 74 YIKSTETGOYAMDTDGLLYGSQTNPNECLFLERLEENHYNTYISKHAEKNWFVGLKKN 133  
QY 115 YIKSTETGOYAMDTDGLLYGSQTNPNECLFLERLEENHYNTYISKHAEKNWFVGLKKN 174

Db 134 GSKRGPRTHYGOKAILFLPLPVSSD 159  
QY 175 GSKRGPRTHYGOKAILFLPLPVSSD 200

RESULT 14

ID W06818 standard; Protein; 168 AA.

AC W06818;

DT 17-MAR-1997 (first entry)

DE Human endothelial cell growth factor.

KW Endothelial cell growth factor; ECGF.

OS Homo sapiens.

FH Key Location/Qualifiers

FT protein 15..168

FT /label= ECGF-beta

FT 35..168

FT /label= ECGF-alpha

PN US5571790-A.

PD 05-NOV-1996.

PF 03-MAR-1986; 835594.

PR 03-MAR-1986; US-835594..

PR 18-DEC-1987; US-134499.

PR 29-APR-1991; US-693079.

PR 27-NOV-1991; US-799859.

PR 03-NOV-1994; US-334884.

PR 07-JUN-1995; US-472964.

PA (RHON ) RHONE POULENC RORER PHARM INC.

PI Burgess W, Drohan WN, Jaye M, Maciag T;

DR WPI; 96-505421/50.

DR N-PSDB; T45985.

PT Recombinant human endothelial cell growth factors - for treating damaged blood vessels, etc.

PS Example D; Fig 8; 22pp; English.

CC Human endothelial cell growth factor (ECGF) is a mitogen for endothelial cells. Its amino acid sequence was deduced from a cDNA clone (T45985) isolated from a human brain stem library.

CC Recombinant ECGF-beta (W06816) and ECGF-alpha (W06817) can be produced in transformed host cells. They have utility in the growth and amplification of endothelial cells in culture, and can potentially be used to treat damaged blood vessels and other endothelial cell-lined structures. They also have diagnostic applns.

CC Sequence 168 AA;

QY Sequence 168 AA;

Query Match 68.5%; Score 985; DB 1; Length 168;

Best Local Similarity 93.8%; Pred. No. 2.14e-86;

Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;

Db 26 TEKFNLP-PG--NYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHQLQLSAESVGEV 82  
QY 55 SDDFELSGSDANYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHQLQLSAESVGEV 114

Db 83 YIKSTETGOYAMDTDGLLYGSQTNPNECLFLERLEENHYNTYISKHAEKNWFVGLKKN 142  
QY 115 YIKSTETGOYAMDTDGLLYGSQTNPNECLFLERLEENHYNTYISKHAEKNWFVGLKKN 174

Db 143 GSKRGPRTHYGOKAILFLPLPVSSD 168  
QY 175 GSKRGPRTHYGOKAILFLPLPVSSD 200

RESULT 15

ID W75413 standard; protein; 134 AA.

AC W75413;

DT 02-MAR-1999 (first entry)

DE Human alpha-endothelial cell growth factor.

KW Human; endothelial cell growth factor; ECGF; brain stem; probe;

KW hybridisation; bovine; wound healing; prosthetic device.

OS Homo sapiens.

PN US5827826-A.

PD 27-OCT-1998.

PF 04-NOV-1996; 743261.



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04-NOV-1996; US-743261.
03-MAR-1986; US-835594.
18-DEC-1987; US-134499.
29-APR-1991; US-693079.
27-NOV-1991; US-799859.
03-NOV-1994; US-334884.
07-JUN-1995; US-472964.
(RHON ) RHONE-POULENC RORER PHARM INC.
Burgess W, Drohan WN, Jaye M, Maciag T;
WPI: 98-594032/50.
Compositions for promoting wound healing - containing endothelial
cell growth factor polypeptides
Claim 1: Column 16: 23pp: English.
This sequence represents the amino acid sequence of the mature human
alpha-endothelial cell growth factor (a-ECGF). The sequence was isolated
from a human brain stem cell cDNA library using a probe designed based on
fragments of the bovine ECGF (see W75416-W75418). The ECGF protein can
be used in compositions for promoting wound healing. ECGF is also used
to grow cells on a prosthetic device.
Sequence 134 AA;

Query Match 68.4%; Score 983; DB 1; Length 134;
Best Local Similarity 100.0%; Pred. N. 3.43e-86;
Matches 134; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

Ddb 1 NYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHILQLLSAESVGEVIKSTETQGYLA 60
|||||
QY 67 NYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHILQLLSAESVGEVIKSTETQGYLA 126
|||||

Ddb 61 MDTDGLLYGSQTPNECIFLRLERLEENHYNTYISKKHAENWFLKNGSKCKRGPRTHYG 120
|||||
QY 127 MDTDGLLYGSQTPNECIFLRLERLEENHYNTYISKKHAENWFLKNGSKCKRGPRTHYG 186
|||||

Ddb 121 QKAILFLPLPVSSD 134
|||||
QY 187 QKAILFLPLPVSSD 200
|||||

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Search completed: Tue Aug 29 15:56:31 2000  
Job time : 16 secs.



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WIREL (TM)  
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MPSrch\_pp protein - protein database search, using Smith-Waterman algorithm  
on: Tue Aug 29 15:55:40 2000; MasPar time 12.06 Seconds  
782.316 Million cell updates/sec  
Bular output not generated.

Title: >US-09-121-017B-19-  
Description: (1-200) from US09121017B.ppt  
Perfect Score: 1438  
Sequence: 1 MAPARLALLFFVGVGAES.....PRHYGQKAILPLPVSSD 200

Scoring table: PAM 150  
Gap 11  
Searched: 142080 seqs, 47172406 residues  
Post-processing: Minimum Match 0%  
Listing first 45 summaries

Database: pir64  
1:pir1 2:pir2 3:pir3 4:pir4  
Statistics: Mean 44.267; Variance 78.123; scale 0.567

Pred. No. is the number of results predicted by chance to have a  
score greater than or equal to the score of the result being printed,  
and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description	Pred. No.
1	985	68.5	155	1	A33665	acidic fibroblast gro 1.04e-195
2	967	67.2	155	1	A00721	acidic fibroblast gro 1.80e-191
3	966	67.2	155	2	D37360	acidic fibroblast gro 3.10e-191
4	966	67.2	155	2	S04147	acidic fibroblast gro 3.10e-191
5	954	66.3	152	1	JH0476	acidic fibroblast gro 2.06e-188
6	917	63.8	155	1	GR0A	acidic fibroblast gro 1.01e-179
7	916	63.7	155	2	A60130	acidic fibroblast gro 1.74e-179
8	906	63.0	155	2	JH0055	fibroblast growth fac 3.86e-177
9	522	36.3	189	2	A48834	basic fibroblast growth 2.15e-88
10	516	35.9	146	1	S00185	basic fibroblast growth 4.89e-87
11	516	35.9	146	1	GR0B	basic fibroblast growth 4.89e-87
12	509	35.4	210	2	A32398	basic fibroblast growth 1.86e-85
13	508	35.3	154	2	C37360	basic fibroblast growth 3.13e-85
14	508	35.3	154	2	A31674	basic fibroblast growth 3.13e-85
15	498	34.6	164	2	S1622	basic fibroblast growth 5.61e-83
16	493	34.3	155	1	A40117	basic fibroblast growth 7.48e-82
17	466	32.4	137	2	I46711	fibroblast growth fac 8.54e-76
18	448	31.2	198	2	JC1457	ryudocan precursor - 8.93e-72
19	350	24.3	208	2	A48137	fibroblast growth fac 3.15e-50
20	350	24.3	208	2	S86486	fibroblast growth fac 3.15e-50
21	329	22.9	207	2	JC5941	fibroblast growth fac 1.05e-45
22	324	22.5	207	2	JC5940	fibroblast growth fac 1.24e-44
23	302	21.0	194	2	S49501	keratinocyte growth f 5.98e-40

24	299	20.8	194	1	A36301	fibroblast growth fac 2.58e-39
25	295	20.5	194	2	I48610	keratinocyte growth f 1.80e-38
26	293	20.4	194	2	S26049	fibroblast growth fac 4.76e-38
27	294	20.4	202	2	A42410	ryudocan precursor - 2.93e-38
28	288	20.0	187	2	S23595	embryonic fibroblast 5.36e-37
29	279	19.4	264	2	A36207	transforming protein 4.11e-35
30	277	19.3	266	2	S68144	fibroblast growth fac 1.08e-34
31	276	19.2	194	2	I50710	fibroblast growth fac 1.74e-34
32	275	19.1	192	2	S54407	embryonic fibroblast 2.81e-34
33	269	18.7	267	1	TVHUF5	transforming protein 4.97e-33
34	266	18.5	60	2	JH0708	fibroblast growth fac 2.08e-32
35	266	18.5	256	2	JC4627	fibroblast growth fac 2.08e-32
36	263	18.3	206	2	JC4268	HST protein - bovine 8.68e-32
37	261	18.2	198	2	JC5613	ryudocan precursor - 2.25e-31
38	257	17.9	168	2	JG0184	fibroblast growth fac 1.50e-30
39	256	17.8	206	1	TVHUF5	fibroblast growth fac 2.41e-30
40	248	17.2	208	2	S20102	fibroblast growth fac 1.05e-28
41	244	17.0	220	2	I50588	FGF-3 - chicken 6.86e-28
42	236	16.4	125	2	A32484	basic fibroblast growth 2.88e-26
43	236	16.4	237	1	S39582	transforming protein 2.88e-26
44	234	16.3	97	2	B46289	keratinocyte growth f 7.30e-26
45	235	16.3	208	2	S14192	fibroblast growth fac 4.59e-26

ALIGNMENTS

RESULT	1	A33665	#type complete
ENTRY		acidic fibroblast growth factor 1 precursor - human	
TITLE		beta-ECGF; endothelial cell growth factor beta;	
ALTERNATE_NAMES		heparin-binding growth factor 1	
ORGANISM		#formal_name Homo sapiens #common_name man	
DATE		10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 10-Sep-1999	
ACCESSIONS		A33665; A32316; S18217; A43804; A24662; JH0707; S35535; S35536; I39413; A23553; A24820; A24243; A24301; A26386; A53639	
REFERENCE		A33665	
#authors		Mezgia, A.; Tischer, E.; Graves, D.; Tumolo, A.; Miller, J.; Gospodarowicz, D.; Abraham, J.A.; Shipley, G.D.; Fiddes, J.C.	
#journal		Biochem. Biophys. Res. Commun. (1989) 164:1121-1129	
#title		Structural analysis of the gene for human acidic fibroblast growth factor.	
#cross-references		MUID:90073637	
#accession		A33665	
#molecule_type		DNA	
##residues		1-155	#label MER
##cross-references		GB:M30491	
REFERENCE		A32316	
#authors		Wang, W.P.; Lehtoma, K.; Varban, M.L.; Krishnan, I.; Chiu, I.M.	
#journal		Mol. Cell. Biol. (1989) 9:2387-2395	
#title		Cloning of the gene coding for human class 1 heparin-binding growth factor and its expression in fetal tissues.	
#cross-references		MUID:89343957	
#accession		A32316	
#molecule_type		DNA	
##residues		1-155	#label WAN
##cross-references		GB:M23087; NID:g183875; PIDN:AAA52638.1; PID:g386768	
REFERENCE		S18217	
#authors		Wang, W.P.; Quick, D.; Balcerzak, S.P.; Needleman, S.W.; Chiu, I.M.	
#journal		Oncogene (1991) 6:1521-1529	
#title		Cloning and sequence analysis of the human acidic fibroblast growth factor gene and its preservation in leukemia patients.	
#cross-references		MUID:92019819	
#accession		S18217	
#molecule_type		DNA	
##residues		1-155	#label WA2
##cross-references		EMBL:M23086	
REFERENCE		A43804	

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acidic fibroblast growth factor.
#cross-references MUID:86295741
#accession A24820
##molecule_type protein
##residues 16-155 ##label GIM
REFERENCE
A90122
Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#authors Biochem. Biophys. Res. Commun. (1986) 135:541-548
#journal Human brain-derived acidic and basic fibroblast growth
#title factors: amino terminal sequences and specific mitogenic
activities.
#cross-references MUID:86186784
#accession A24243
##molecule_type protein
##residues 16-47 ##label Gi2
##experimental_source brain
REFERENCE
A91364
Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
#authors FEBS Lett. (1986) 204:203-207
#journal Partial molecular characterization of endothelial cell
#title mitogens from human brain: acidic and basic fibroblast
growth factors.
#cross-references MUID:86275260
#accession A24301
##molecule_type protein
##residues 16-30,'X',32-49 ##label GAU
REFERENCE
A26386
Gautschi-Sova, P.; Muller, T.; Bohlen, P.
#authors Biochem. Biophys. Res. Commun. (1986) 140:874-880
#journal Amino acid sequence of human acidic fibroblast growth factor
#title
#cross-references MUID:87048871
#accession A26386
##molecule_type protein
##residues 16-155 ##label GA2
##experimental_source brain
REFERENCE
A53639
Chavan, A.J.; Haley, B.E.; Volklin, D.B.; Marfia, K.E.;
#authors Verticelli, A.M.; Bruner, M.W.; Draper, J.P.; Burke, C.J.;
Middaugh, C.R.
#journal Biochemistry (1994) 33:7193-7202
#title Interaction of nucleotides with acidic fibroblast growth
factor (FGF-1).
#cross-references MUID:94271773
#accession A53639
##molecule_type protein
##residues 16-30,'X',32-38;73-75,'X',77-97,'X',99-101;128-131,'X',
133-140,'X',142-152 ##label CHA
GENETICS
#gene GDB:FGF1; FGFA
#cross-references GDB:119909; OMIM:131220
#map_position 5q31.3-5q33.2
#introns 57/1; 91/3
CLASSIFICATION
#superfamily fibroblast growth factor
KEYWORDS
alternative splicing; growth factor; heparin binding
FEATURE
16-155
#product fibroblast growth factor 1 #status experimental
#label MATN
#binding_site carbohydrate (Asn) (covalent) #status
absent
SUMMARY
#length 155 #molecular-weight 17460 #checksum 9243
Query Match 68.5%; Score 985; DB 1; Length 155;
Best Local Similarity 93.8%; Pred.No.1.04e-195;
Matches 137; Conservative 5; Mismatches 1; Indels 3; Gaps 2;
Db 13 TEFNLP-PG--NYKKPKLLYCSNGHFLRILPDGTVDGTRDSQHIQLQLSAESVGEV 69
:: |:|::|
Qy 55 SDFELSGSGDANYKKPKLLYCSNGHFLRILPDGTVDGTRDSQHIQLQLSAESVGEV 114
Db 70 YIKSTGTQGLAMDTGLLYGSGQTNEECFLERLEENHYNTYISKKAENKWFVGLKKN 129
:: |:|::|
Qy 115 YIKSTGTQGLAMDTGLLYGSGQTNEECFLERLEENHYNTYISKKAENKWFVGLKKN 174

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Db 130 GSCRRGPRTHYGQKAILFLPLPVSSD 155
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Qy 175 GSCRRGPRTHYGQKAILFLPLPVSSD 200

RESULT 2
ENTRY #type complete
TITLE acidic fibroblast growth factor - golden hamster
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Mesocricetus auratus #common_name golden hamster
DATE 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change
10-Sep-1999

ACCESSIONS A60721
REFERENCE A60721
#authors Hall, J.A.; Harris, M.A.; Malark, M.; Mansson, P.E.; Zhou,
H.; Harris, S.E.
#journal J. Cell. Biochem. (1990) 43:17-26
#title Characterization of the hamster DGT-1 cell aFGF/HBGF-I gene
and cDNA and its modulation by steroids.
#cross-references MUID:90270291
#accession A60721
#status not compared with conceptual translation
#molecule_type DNA
#residues 1-155 #label HAL
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17403 #checksum 9573

Query Match 67.2%; Score 967; DB 1; Length 155;
Best Local Similarity 97.0%; Pred. No. 1.80e-191;
Matches 131; Conservative 2; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVIKGTGQYL 80
:|||||
Qy 66 ANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVIKSTETGQYL 125
:|||||

Db 81 AMDTGLLYGSQTPNECLFLERLEENHNTYTSKKHAENWVGLKKNKSGCKRGPRTHY 140
|||||
Qy 126 AMDTGLLYGSQTPNECLFLERLEENHNTYTSKKHAENWVGLKKNKSGCKRGPRTHY 185
|||||

Db 141 GQKAILFLPLPVSSD 155
|||||
Qy 186 GQKAILFLPLPVSSD 200

Query Match 67.2%; Score 967; DB 1; Length 155;
Best Local Similarity 97.0%; Pred. No. 1.80e-191;
Matches 131; Conservative 2; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVIKGTGQYL 80
:|||||
Qy 66 ANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVIKSTETGQYL 125
:|||||

Db 81 AMDTGLLYGSQTPNECLFLERLEENHNTYTSKKHAENWVGLKKNKSGCKRGPRTHY 140
|||||
Qy 126 AMDTGLLYGSQTPNECLFLERLEENHNTYTSKKHAENWVGLKKNKSGCKRGPRTHY 185
|||||

Db 141 GQKAILFLPLPVSSD 155
|||||
Qy 186 GQKAILFLPLPVSSD 200

RESULT 3
ENTRY #type complete
TITLE acidic fibroblast growth factor - mouse
ALTERNATE_NAMES aFGF; FGF-1
ORGANISM #formal_name Mus musculus #common_name house mouse
DATE 17-Apr-1993 #sequence_revision 17-Apr-1993 #text_change
16-Jul-1999

ACCESSIONS D37360; JC5231
REFERENCE D37360; JC5231
#authors Hebert, J.M.; Basilico, C.; Goldfarb, M.; Haub, O.; Martin,
G.R.
#journal Dev. Biol. (1990) 138:454-463
#title Isolation of cDNAs encoding four mouse FGF family members and
characterization of their expression patterns during
embryogenesis.
#cross-references MUID:90201563
#accession D37360
#status preliminary
#molecule_type mRNA
#residues 1-155 #label HEB
#cross-references GB:M30641; NID:g193284; PIDN:AAA37618.1; PID:g309236
REFERENCE JC5231
#authors Madiai, F.; Hackshaw, K.V.; Chiu, I.M.
#journal Gene (1996) 179:231-236
#title Cloning and characterization of the mouse Fgf-1 gene.
#cross-references MUID:97128312
#accession JC5231
#status preliminary
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##molecule_type DNA
##residues 1-155 #label MAD
##cross-references GB:U36456
COMMENT This protein is an inducer of neovascularization in angiogenic
disease including atherosclerosis, cancer and inflammatory
autoimmune disease.

GENETICS
#gene Fgf-1
#introns 57/1; 91/3
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341

Query Match 67.2%; Score 966; DB 2; Length 155;
Best Local Similarity 96.3%; Pred. No. 3.10e-191;
Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVIKGTGQYL 80
:|||||
Qy 66 ANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVIKSTETGQYL 125
:|||||

Db 81 AMDTEGLLYGSQTPNECLFLERLEENHNTYTSKKHAENWVGLKKNKSGCKRGPRTHY 140
|||||
Qy 126 AMDTGLLYGSQTPNECLFLERLEENHNTYTSKKHAENWVGLKKNKSGCKRGPRTHY 185
|||||

Db 141 GQKAILFLPLPVSSD 155
|||||
Qy 186 GQKAILFLPLPVSSD 200

RESULT 4
ENTRY #type complete
TITLE acidic fibroblast growth factor 1 - rat
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Rattus norvegicus #common_name Norway rat
DATE 28-Feb-1990 #sequence_revision 28-Feb-1990 #text_change
16-Jul-1999

ACCESSIONS S04147
REFERENCE S04147
#authors Goodrich, S.P.; Yan, G.C.; Bahrenburg, K.; Mansson, P.E.
#journal Nucleic Acids Res. (1989) 17:2867
#title The nucleotide sequence of rat heparin binding growth factor
1 (HBGF-1).
#cross-references MUID:89240051
#accession S04147
##molecule_type mRNA
##residues 1-155 #label GOO
##cross-references EMBL:X14232; NID:g56351; PIDN:CAA32448.1; PID:g56352
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341

Query Match 67.2%; Score 966; DB 2; Length 155;
Best Local Similarity 96.3%; Pred. No. 3.10e-191;
Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVIKGTGQYL 80
:|||||
Qy 66 ANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVIKSTETGQYL 125
:|||||

Db 81 AMDTEGLLYGSQTPNECLFLERLEENHNTYTSKKHAENWVGLKKNKSGCKRGPRTHY 140
|||||
Qy 126 AMDTGLLYGSQTPNECLFLERLEENHNTYTSKKHAENWVGLKKNKSGCKRGPRTHY 185
|||||

Db 141 GQKAILFLPLPVSSD 155
|||||
Qy 186 GQKAILFLPLPVSSD 200

RESULT 5
ENTRY #type fragment
TITLE acidic fibroblast growth factor - pig (fragment)
ORGANISM #formal_name Sus scrofa domestica #common_name domestic pig
DATE 31-Mar-1992 #sequence_revision 31-Mar-1992 #text_change
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16-Jul-1999
ACCESSIONS      JH0476; S20072
REFERENCE       JH0476
#authors       Schmidt, M.; Sharma, H.S.; Schott, R.J.; Schaper, W.
#journal       Biochem. Biophys. Res. Commun. (1991) 180:853-859
#title         Amplification and sequencing of mRNA encoding acidic
               fibroblast growth factor (aFGF) from porcine heart.
#cross-references MUID:92062117
#accession     JH0476
#molecule_type mRNA
#residues      1-152 ##label SCH
#cross-references EMBL:X60317; NID:g1873; PIDN:CAA42869.1; PID:g1874
#experimental_source heart
#note          the hydrophobic core residues are packed around the
               internal symmetry axis
COMMENT        This protein belongs to the fibroblast growth factor family.
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS        growth factor; heparin binding
FEATURE
22-28          #region nuclear location signal\
133            #binding site heparin (Lys) #status predicted
JMWARY         #length 152 #checksum 1124

Query Match      66.3%; Score 954; DB 2; Length 152;
Best Local Similarity 91.6%; Pred. No. 2.06e-188;
Matches 131; Conservative 6; Mismatches 3; Indels 3; Gaps 2;

Db 13 TEKFNLP-PG--NYKKPKLLYCSNGHFLRLPDGTVGTRDRSDQHLOQLSAESVGEV 69
QY 55 SDDFELSGSDGANNYKKPKLLYCSNGHFLRLPDGTVGTRDRSDQHLOQLSAESVGEV 114
Db 70 YKSTETGOYLANDTDGLLYGSGTPESECLFLERLEENHNYTTSKHAENKWFVGLKKN 129
QY 115 YKSTETGOYLANDTDGLLYGSGTPESECLFLERLEENHNYTTSKHAENKWFVGLKKN 174
Db 130 GSKRGPRTHYGQKAILFLPLV 152
QY 175 GSKRGPRTHYGQKAILFLPLV 197

RESULT          6
ENTRY           GRBOA      #type complete
TITLE           acidic fibroblast growth factor precursor - bovine
ALTERNATE_NAMES aFGF; eye-derived growth factor II; heparin-binding growth
               factor I; prostatin
ORGANISM        #formal_name Bos primigenius taurus #common_name cattle
DATE            13-Aug-1986 #sequence_revision 03-Feb-1994 #text_change
               18-Jun-1999
CESSIONS        JH0613; S02102; S02065; B24663; A94281; S03953;
               A91010; A24477; B25043; C25043; A24539; A60884;
               A37892; B37892; A61198; I46024; A34477; A01385
REFERENCE       JH0613
#authors        Renaud, F.; Desset, S.; Bugra, K.; Halley, C.; Philippe,
               J.M.; Courtols, Y.; Laurent, M.
#journal        Biochem. Biophys. Res. Commun. (1992) 184:945-952
#title          Heterogeneity of 3' untranslated region of bovine acidic FGF
               transcripts.
#cross-references MUID:92246990
#accession      JH0613
#molecule_type DNA
#residues       58-155 ##label REN
REFERENCE       S02102
#authors        Halley, C.; Courtols, Y.; Laurent, M.
#journal        Nucleic Acids Res. (1988) 16:10913
#title          Nucleotide sequence of bovine acidic fibroblast growth factor
               cDNA.
#cross-references MUID:89083506
#accession      S02102
#molecule_type mRNA
#residues       1-155 ##label HAL
#cross-references EMBL:X13221; NID:g347; PIDN:CAA31610.1; PID:g348
REFERENCE       S02661
#authors        Alterio, J.; Halley, C.; Brou, C.; Soussi, T.; Courtols, Y.;

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Laurent, M.
FEBS Lett. (1988) 242:41-46
#journal        Characterization of a bovine acidic FGF cDNA clone and its
#title          expression in brain and retina.
#cross-references MUID:89078619
#accession      S02661
#molecule_type mRNA
#residues       1-155 ##label ALT
#cross-references EMBL:X14032; NID:g322; PIDN:CAA32192.1; PID:g323
REFERENCE       S22065
#authors        Philippe, J.M.
#journal        Submitted to the EMBL Data Library, May 1992
#title          #molecule_type mRNA
#residues       1-18 ##label PHI
#cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
REFERENCE       A94290
#authors        Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman,
               J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal        Science (1986) 233:545-548
#title          Nucleotide sequence of a bovine clone encoding the angiogenic
               protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession      A94281
#molecule_type protein
#residues       62-102 ##label ABR
REFERENCE       A94281
#authors        Gimenez-Gallego, G.; Rodkey, J.; Bennett, C.; Rios-Candelore,
               M.; DiSalvo, J.; Thomas, K.
#journal        Science (1985) 230:1385-1388
#title          Brain-derived acidic fibroblast growth factor: complete amino
               acid sequence and homologues.
#cross-references MUID:86070224
#accession      A94281
#molecule_type protein
#residues       16-155 ##label GIM
REFERENCE       S03953
#authors        Quinkler, W.; Maasberg, M.; Bernotat-Danielowski, S.; Luethe,
               N.; Sharma, H.S.; Schaper, W.
#journal        Eur. J. Biochem. (1989) 181:67-73
#title          Isolation of heparin-binding growth factors from bovine,
               porcine and canine hearts.
#cross-references MUID:89231704
#accession      S03953
#molecule_type protein
#residues       16-45 ##label QUI
REFERENCE       A91010
#authors        Bohlen, P.; Esch, F.; Baird, A.; Gospodarowicz, D.
#journal        EMBO J. (1985) 4:1951-1956
#title          Acidic fibroblast growth factor (FGF) from bovine brain:
               amino-terminal sequence and comparison with basic FGF.
#cross-references MUID:86055750
#accession      A91010
#molecule_type protein
#residues       16-30; 'X', 32-34; 'X', 36-44 ##label BOH
REFERENCE       A24477
#authors        Crabb, J.W.; Ames, L.G.; Carr, S.A.; Johnson, C.M.; Roberts,
               G.D.; Bordoli, R.S.; McKeehan, W.L.
#journal        Biochemistry (1986) 25:4988-4993
#title          Complete primary structure of prostatin, a prostate
               epithelial cell growth factor.
#cross-references MUID:87026586
#accession      A24477
#molecule_type protein
#residues       2; 'GE', 5-155 ##label CRA
REFERENCE       A94127
#authors        Burgess, W.H.; Mehlman, T.; Marshak, D.R.; Fraser, B.A.;
               Maciag, T.
#journal        Proc. Natl. Acad. Sci. U.S.A. (1986) 83:7216-7220
#title          Structural evidence that endothelial cell growth factor beta
               is the precursor of both endothelial cell growth factor
               alpha and acidic fibroblast growth factor.
#cross-references MUID:87016918

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#accession B25043
#molecule_type protein
#residues 2-155 #label BUR
#note this form was designated beta endothelial cell growth factor

#accession C25043
#molecule_type protein
#residues 16-155 #label BU2
#note this form was designated acidic fibroblast growth factor

#accession A25043
#molecule_type protein
#residues 22-155 #label BU3
#note this form was designated alpha endothelial cell growth factor

REFERENCE
A24539
#authors Strydom, D.J.; Harper, J.W.; Lobb, R.R.
#journal Biochemistry (1986) 25:945-951
#title Amino acid sequence of bovine brain derived class 1 heparin-binding growth factor.

#cross-references MUID:86187766
#accession A24539
#molecule_type protein
#residues 16-155 #label STR

REFERENCE
A60884
#authors Thomas, K.A.; Gimenez-Gallego, G.; Rios-Candelore, M.; DiSalvo, J.
#journal J. Protein Chem. (1987) 6:163-171
#title Primary structure and mitogenic and angiogenic activities of brain-derived acidic fibroblast growth factor.

#accession A60884
#molecule_type protein
#residues 16-155 #label THO

REFERENCE
A37892
#authors Kuo, M.D.; Huang, S.S.; Huang, J.S.
#journal J. Biol. Chem. (1990) 265:16455-16463
#title Acidic fibroblast growth factor receptor purified from bovine liver is a novel protein tyrosine kinase.

#cross-references MUID:90375514
#accession A37892
#molecule_type protein
#residues 22-30, 'X', 32-38 #label KU2
#note this form was designated brain-derived growth factor A

#accession B37892
#molecule_type protein
#residues 62-76, 'X', 78-86 #label KUO
#note this sequence is an amino-terminal fragment of a form designated as brain-derived growth factor B

REFERENCE
A61198
#authors Hill, C.E.; Belford, D.A.; Godovac-Zimmermann, J.; Hendry, I.A.
#journal Brain Res. Dev. Brain Res. (1991) 63:13-19
#title Class 1 heparin binding growth factor promotes the differentiation but not the survival of ciliary neurones in vivo.

#cross-references MUID:92164087
#accession A61198
#molecule_type protein
#residues 11-26; 28-50; 53-110, 'H', 112, 'NTY'; 134-155 #label HIL

REFERENCE
I46024
#authors Philippe, J.M.; Renaud, F.; Desset, S.; Laurent, M.; Mallet, J.; Courtois, Y.; Edwards, J.B.
#journal Biochem. Biophys. Res. Commun. (1992) 188:843-850
#title Cloning of two different 5' untranslated exons of bovine acidic fibroblast growth factor by the single strand ligation to single-stranded cDNA methodology.

#cross-references MUID:93075172
#accession I46024
#status translated from GB/EMBL/DBJ
#molecule_type mRNA
#residues 1-18 #label PH2
#cross-references EMBL:X66446; NID:g411; PIDN:CAA7063.1; PID:g412

REFERENCE
A34477
#authors Sasaki, H.; Hoshi, H.; Hong, Y.M.; Suzuki, T.; Kato, T.;

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Sasaki, H.; Saito, M.; Youki, H.; Karube, K.; Konno, S.; Onodera, M.; Saito, T.; Aoyagi, S.
J. Biol. Chem. (1989) 264:17606-17612
Purification of acidic fibroblast growth factor from bovine heart and its localization in the cardiac myocytes.

#cross-references MUID:9008933
#accession A34477
#status preliminary
#molecule_type protein
#residues 16-24; 121-127; 134-143 #label SAS
#experimental_source heart

COMMENT The acidic and basic fibroblast growth factors are the major endothelial-cell growth factors. Both are angiogenic agents in vivo and are potent mitogens for a variety of mesoderm-derived cell types in vitro (although bFGF is 30-100 times more potent than aFGF in stimulating the proliferation of normal diploid cells). There are differences in the tissue distribution and concentration of these two growth factors.

COMMENT This protein binds heparin, although less strongly than does bFGF. There are some sequence similarities between residues 117-126 (a region flanked by Lys-Lys dipeptides) and a number of neuro-peptides, including a gastrin-releasing peptide from the pig

...: remainder of annotations omitted.

Query Match 63.8%; Score 917; DB 1; Length 155;
Best Local Similarity 91.9%; Pred. No. 1.01e-179;
Matches 124; Conservative 6; Mismatches 5; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGYFLRLPDGTVDGTYKDRSDQHQLQCAESIGEVIKSTETGQFL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 66 ANYKKPKLLYCSNGGHFLRLPDGTVDGTYKDRSDQHQLQCAESIGEVIKSTETGQYL 125

Db 81 AMDTDLGLYGSQTPNEECFLERLEENHYNTYISKHAKEHFWGLKNGRSKLGPRTHF 140
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 126 AMDTDLGLYGSQTPNEECFLERLEENHYNTYISKHAKEHFWGLKNGRSKLGPRTHY 185

Db 141 GQKAILFLPLPVSSD 155
|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 186 GQKAILFLPLPVSSD 200

RESULT 7
ENTRY A60130 #type complete
TITLE acidic fibroblast growth factor - chicken
ALTERNATE_NAMES endothelial cell growth factor
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE 03-Mar-1993 #sequence_revision 03-Mar-1993 #text_change 16-Jul-1999
ACCESSIONS A60130; S02639
REFERENCE A60130
#authors Schnuerch, H.; Risau, W.
#journal Development (1991) 111:1143-1154
#title Differentiating and mature neurons express the acidic fibroblast growth factor gene during chick neural development.

#cross-references MUID:91347925
#accession A60130
#status preliminary
#molecule_type mRNA
#residues 1-155 #label SCH
#cross-references GB:S63263; NID:g234372; PIDN:AAB19629.1; PID:g234373

REFERENCE S02639
#authors Risau, W.; Gautschi-Sova, P.; Boehlen, P.
#journal EMBO J. (1988) 7:959-962
#title Endothelial cell growth factors in embryonic and adult chick brain are related to human acidic fibroblast growth factor.

#cross-references MUID:88296438
#accession S02639
#molecule_type protein
#residues 22-30, 'X', 32-44, 'X', 46-48 #label RIS
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor

```

```
SUMMARY      #length 155 #molecular-weight 17322 #checksum 7617
Query Match      63.7%; Score 916; DB 2; Length 155;
Best Local Similarity 90.4%; Pred. No. 1.74e-179;
Matches 122; Conservative 6; Mismatches 7; Indels 0; Gaps 0;

Db 21 GNYKPKLLYCSNGGFFLRILPDGKVDGTRDRSDQHILQLSAEDVGEVIYKSTASGOYL 80
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 66 ANYKPKLLYCSNGGFFLRILPDGKVDGTRDRSDQHILQLSAESVGEVIYKSTETGOYL 125
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 81 AMDTNGLLYCSLPDGECLFLERLEENHYNTYISKHAEDKKNFVGLKNGSKLGPRTYH 140
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 126 AMDTGLLYGSGTPEECFLERLEENHYNTYISKHAEDKKNFVGLKNGSKRGPRTYH 185
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 141 GOKAILFLPLPVSSD 155
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 186 GOKAILFLPLPVSSD 200
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 8
ENTRY   JW0055 #type complete
TITLE   fibroblast growth factor-1 - sheep
ALTERNATE_NAMES  FGF-1
ORGANISM  #formal_name Ovis sp. #common_name sheep
DATE      17-Jun-1998 #sequence_revision 10-Jul-1998 #text_change
          07-May-1999
ACCESSIONS  JW0055
REFERENCE   JW0055
#authors    Grieb, T.W.; Ring, M.; Brown, E.; Palmer, C.; Belle, N.;
            Donjerovic, D.; Chang, H.; Yun, J.; Subramanian, R.;
            Forozan, F.; Guo, Y.; Vertes, A.; Winkles, J.A.; Burgess,
            W.H.
#journal    Biochem. Biophys. Res. Commun. (1998) 246:182-191
#title      Primary structure of ovine fibroblast growth factor-1 deduced
            by protein and cDNA analysis.
#cross-references  MUID:98262939
#accession  JW0055
#molecule_type  mRNA
#residues   1-155 #label GRI
COMMENT    This protein is a potent mitogenic factor for NIH 3T3 fibroblasts
            in the absence of heparin.
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY      #length 155 #molecular-weight 17557 #checksum 8890
Query Match      63.0%; Score 906; DB 2; Length 155;
Best Local Similarity 90.4%; Pred. No. 3.86e-177;
Matches 122; Conservative 8; Mismatches 5; Indels 0; Gaps 0;

Qy 21 GNYKPKLLYCSNGGFFLRILPDGKVDGTRDRSDQHILQLSAESIGEVYIKSTETGOFL 80
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 66 ANYKPKLLYCSNGGFFLRILPDGKVDGTRDRSDQHILQLSAESVGEVIYKSTETGOYL 125
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 81 AMDTNGLLYCSLPDGECLFLERLEENHYNTYISKHAEDKKNFVGLKNGSKLGPRTYH 140
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 126 AMDTGLLYGSGTPEECFLERLEENHYNTYISKHAEDKKNFVGLKNGSKRGPRTYH 185
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 141 GOKAILFLPLPVSSD 155
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 186 GOKAILFLPLPVSSD 200
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 9
ENTRY   A48834 #type complete
TITLE   basic fibroblast growth factor - chicken
ORGANISM  #formal_name Gallus gallus #common_name chicken
DATE      01-Dec-1993 #sequence_revision 18-Nov-1994 #text_change
          16-Jul-1999
ACCESSIONS  A48834
REFERENCE   A48834
#authors    Borja, A.Z.; Meijers, C.; Zeller, R.
#journal    Dev. Biol. (1993) 157:110-118
#title      Expression of alternatively spliced bFGF first coding exons
            and antisense mRNAs during chicken embryogenesis.
```

```
#cross-references  MUID:93246053
#accession  A48834
#status      preliminary
#molecule_type  nucleic acid
#residues    1-189 #label BOR
#experimental_source  embryo
#note        sequence extracted from NCBI backbone (NCBIN:131000,
            NCBIP:131001)
REFERENCE     S23636
#authors      Mitrani, E.; Gruenbaum, Y.; Shohat, H.; Ziv, T.
#journal      Development (1990) 109:387-393
#title        Fibroblast growth factor during mesoderm induction in the
            early chick embryo.
#cross-references  MUID:90382254
#accession  S23636
#status      preliminary
#molecule_type  DNA
#residues    95-128 #label MIT
#cross-references  EMBL:X56804; NID:G62855; PIDN:CAA40139.1; PID:G62856
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY      #length 189 #molecular-weight 20312 #checksum 8538
Query Match      36.3%; Score 522; DB 2; Length 189;
Best Local Similarity 54.5%; Pred. No. 2.15e-88;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

Db 58 GHFKDKPKLYCKNGGFFLRILPNPDGKVDGTRDRSDQHILQLSAEERGVVSIKGVSANRFL 117
      :|||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 66 ANYKPKLLYCSNGGFFLRILPDGKVDGTRDRSDQHILQLSAESVGEVIYKSTETGOYL 125
      :|||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 118 AMKEDGRLLALKATECFEFLERLESNNYNTYISKYSYD--WYVALKRTGQYKPGPKTGP 175
      :|||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 126 AMDTGLLYGSGTPEECFLERLEENHYNTYISKHAEDKKNFVGLKNGSKRGPRTYH 185
      :|||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 176 GOKAILFLPLPVSSAKS 189
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 186 GOKAILFLPLPVSS 199
      :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 10
ENTRY   S00185 #type complete
TITLE   basic fibroblast growth factor - sheep
ALTERNATE_NAMES  protatropin
ORGANISM  #formal_name Ovis orientalis aries, Ovis ammon aries
            #common_name domestic sheep
DATE      10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change
          10-Sep-1999
ACCESSIONS  S00185
REFERENCE   S00185
#authors      Simpson, R.J.; Moritz, R.L.; Lloyd, C.J.; Fabri, L.J.; Nice,
            E.C.; Rubira, M.R.; Burgess, A.W.
#journal      FEBS Lett. (1987) 224:128-132
#title        Primary structure of ovine pituitary basic fibroblast growth
            factor.
#cross-references  MUID:88055577
#accession  S00185
#molecule_type  protein
#residues    1-146 #label SIM
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS      growth factor; heparin binding; mitogen
FEATURES
107-110
18-22
SUMMARY      #region heparin binding #status predicted\
            #region heparin binding #status predicted
            #length 146 #molecular-weight 16434 #checksum 3560
Query Match      35.9%; Score 516; DB 1; Length 146;
Best Local Similarity 55.2%; Pred. No. 4.89e-87;
Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;

Db 15 GHFKDKPKLYCKNGGFFLRILPNPDGKVDGTRDRSDQHILQLSAEERGVVSIKGVCANRFL 74
      :|||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 66 ANYKPKLLYCSNGGFFLRILPDGKVDGTRDRSDQHILQLSAESVGEVIYKSTETGOYL 125
      :|||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
```



This protein binds heparin more strongly than does aFGF.

```

CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS alternative splicing; angiogenesis; growth factor; heparin
binding; mitogen

FEATURE
1-157 #product basic fibroblast growth factor, uterine form
#status predicted #label MAT1\
4-157 #product basic fibroblast growth factor, pituitary gamma
form #status experimental #label MAT2\
12-157 #product basic fibroblast growth factor, pituitary alpha
form #status experimental #label MAT3\
16-157 #product basic fibroblast growth factor, pituitary short
form #status predicted #label MAT4\
23-157 #product basic fibroblast growth factor, hepatic form
#status experimental #label MAT5\
27-157 #product basic fibroblast growth factor, renal form
#status experimental #label MAT6\
29-33,118-121 #region heparin binding #status predicted\
4 #modified site blocked amino end (Ala) (in mature form
pituitary gamma) (probably acetylated) #status
experimental
SUMMARY #length 157 #checksum 1115
Query Match 35.9%; Score 516; DB 1; Length 157;
Best Local Similarity 55.2%; Pred. No. 4.89e-87;
Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;

Db 26 GHFDPKRLKNGGFFLRIHPDGRVDGVREKSPHKLQLOAERGVSIVKGVCANRYL 85
::: || || || || || || || || || || || || || || || || || || ||
Qy 66 ANYKKPKLLYCSNGHFRLPDGTVDTRSDQHQLQLSASVGEVIYKSTETGQYL 125
|| || || || || || || || || || || || || || || || || || || ||
Db 86 AMKEDGRLLASKVTDECFERLESNNYVRSRKYTS--SWYVALKRTGQYKLGPKTGP 143
|| || || || || || || || || || || || || || || || || || || ||
Qy 126 AMDTDGLLYGQTPNEECFLERLEENHNYIYSKKHAEKNFVGLKNGSKRGPRTHY 185
|| || || || || || || || || || || || || || || || || || || ||
Db 144 GQKAILFLPMSAKS 157
|||||||::: |
Qy 186 GQKAILFLPLPVSS 199

RESULT 12
ENTRY #type complete
TITLE basic fibroblast growth factor precursor, 22.5K form - human
ALTERNATE_NAMES bFGF; fibroblast growth factor 2; prostatic growth factor;
prostatropin
CONTAINS basic fibroblast growth factor, 18K form
ORGANISM #formal_name Homo sapiens #common_name man
DATE 31-Jul-1989 #sequence_revision 31-Dec-1993 #text_change
16-Jul-1999
A32398; A61537; A26642; B32878; S00297; A54316; B54316;
A33624; A25824; B24243; B24301; S42242; B55784; I52267;
S46253
SESSIONS
REFERENCE
#authors Prats, H.; Kaghad, M.; Prats, A.C.; Klagsbrun, M.; Lelias,
J.M.; Liauzun, P.; Chalon, P.; Tauber, J.P.; Amalric, F.;
Smith, J.A.; Caput, D.
#journal Proc. Natl. Acad. Sci. U.S.A. (1989) 86:1836-1840
#title High molecular mass forms of basic fibroblast growth factor
are initiated by alternative CUG codons.
#cross-references MUID:89184522
#accession A32398
#molecule_type mRNA
#residues 1-210 #label PRA
##cross-references GB:J04513; NID:g183083; PIDN:AAAS2531.1; PID:g459811
REFERENCE
#authors Shibata, F.; Baird, A.; Florkiewicz, R.Z.
#journal Growth Factors (1991) 4:277-287
#title Functional characterization of the human basic fibroblast
growth factor gene promoter.
#cross-references MUID:92110035
#accession A61537
#molecule_type DNA
#residues 1-114 #label SH1
#note authors translated the codon GGA for residue 47 as Ala

```

```

REFERENCE
A26642
#authors Kurokawa, T.; Sasada, R.; Iwane, M.; Igarashi, K.
#journal FEBS Lett. (1987) 213:189-194
#title Cloning and expression of cDNA encoding human basic
fibroblast growth factor.
#cross-references MUID:87162468
#accession A26642
#molecule_type mRNA
#residues 56-210 #label KUR
##cross-references GB:M27968; NID:g182562; PIDN:AAAS2448.1; PID:g182563
REFERENCE
A90924
#authors Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes,
J.C.
#journal Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668
#title Human basic fibroblast growth factor: nucleotide sequence,
genomic organization, and expression in mammalian cells.
#cross-references MUID:87217066
#accession B32878
#molecule_type mRNA
#residues 56-210 #label ABR
#note the authors translated the codon GAA for residue 108 as
Gly
REFERENCE
S00297
#authors Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Friedman,
J.; Gospodarowicz, D.; Fiddes, J.C.
#journal EMBO J. (1986) 5:2523-2528
#title Human basic fibroblast growth factor: nucleotide sequence and
genomic organization.
#cross-references MUID:87053817
#accession S00297
#status not compared with conceptual translation
#molecule_type DNA
#residues 1-155 #label AB2
#note the authors translated the codon GAA for residue 108 as
Gly
REFERENCE
A54316
#authors Shimoyama, Y.; Gotoh, M.; Ino, Y.; Sakamoto, M.; Kato, K.;
Hirohashi, S.
#journal Jpn. J. Cancer Res. (1991) 82:1263-1270
#title Characterization of high-molecular-mass forms of basic
fibroblast growth factor produced by hepatocellular
carcinoma cells: possible involvement of basic fibroblast
growth factor in hepatocarcinogenesis.
#cross-references MUID:92091228
#accession A54316
#molecule_type protein
#residues 'XX',86-88,'X',90-91,'X',93-95 #label SH3
#note experimental source C-Li21 hepatocellular carcinoma cell line
sequence extracted from NCBI backbone (NCBIP:71595)
#accession B54316
#molecule_type protein
#residues 'XXX',19,'X',21-29 #label SH2
#note sequence extracted from NCBI backbone (NCBIP:71594)
REFERENCE
A33624
#authors Felge, J.J.; Bradley, J.D.; Fryburg, K.; Farris, J.; Cousins,
L.C.; Barr, P.J.; Baird, A.
#journal J. Cell Biol. (1989) 109:3105-3114
#title Differential effects of heparin, fibronectin, and laminin on
the phosphorylation of basic fibroblast growth factor by
protein kinase C and the catalytic subunit of protein
kinase A.
#cross-references MUID:90078343
#accession A33624
#status preliminary
#molecule_type protein
#residues 57-210 #label FEI
REFERENCE
A25824
#authors Story, M.T.; Esch, F.; Shimasaki, S.; Sasse, J.; Jacobs,
S.C.; Lawson, R.K.
#journal Biochem. Biophys. Res. Commun. (1987) 142:702-709
#title Amino-terminal sequence of a large form of basic fibroblast
growth factor isolated from human benign prostatic
hyperplastic tissue.

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#cross-references MUID:87156686
#accession A25824
#molecule_type protein
#residues 57-77 #label STO
#experimental_source prostate

REFERENCE
A90122
Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
Biochem. Biophys. Res. Commun. (1986) 135:541-548
#journal
#title Human brain-derived acidic and basic fibroblast growth
factors: amino terminal sequences and specific mitogenic
activities
#cross-references MUID:86186784
#accession B24243
#molecule_type protein
#residues 65-102,'X',104-105 #label GIM
#experimental_source brain

REFERENCE
A91364
Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
FEBS Lett. (1986) 204:203-207
#journal
#title Partial molecular characterization of endothelial cell
mitogens from human brain: acidic and basic fibroblast
growth factors.
#cross-references MUID:86275260
#accession B24301
#molecule_type protein
#residues 65-88,'X',90-98,'X',100 #label GAU
#authors Sommer, A.; Brewer, M.T.; Thompson, R.C.; Moscatelli, D.;
Presta, A.; Rifkin, D.B.
#journal Biochem. Biophys. Res. Commun. (1987) 144:543-550
#title A form of human basic fibroblast growth factor with an
extended amino terminus.
#cross-references MUID:87213238
#accession S42242
#status preliminary
#molecule_type mRNA
#residues 54-210 #label SOM
#cross-references EMBL:M17599; NID:g183086; PIDN:AAA52534.1;
PID:g183087

REFERENCE
A55784
Pantoliano, M.W.; Horlick, R.A.; Springer, B.A.; Van Dyk,
D.E.; Tobery, T.; Wetmore, D.R.; Lear, J.D.; Nahapetian,
A.T.; Bradley, J.D.; Sisk, W.P.
Biochemistry (1994) 33:10229-10248
#journal
#title Multivalent ligand-receptor binding interactions in the
fibroblast growth factor system produce a cooperative
growth factor and heparin mechanism for receptor
dimerization.
#cross-references MUID:94347757
#accession B55784
#molecule_type protein
#residues 54-71 #label PAN

REFERENCE
I52267
Watson, R.; Anthony, F.; Pickett, M.; Lambden, P.; Masson,
G.M.; Thomas, E.J.
Biochem. Biophys. Res. Commun. (1992) 187:1227-1231
#journal
#title Reverse transcription with nested polymerase chain reaction
shows transfection of basic fibroblast growth factor
transcripts in human granulosa and cumulus cells from in
vitro fertilisation patients.
#cross-references MUID:93038590
#accession I52267
#status preliminary; translated from GB/EMBL/DBD
#molecule_type mRNA
#residues 95-182 #label RES
#cross-references GB:S47380; NID:g256535
#experimental_source granulosa cells

REFERENCE
S46253
Petry, V.; Bugler, B.; Amalric, F.; Prone, J.C.; Prats, H.
FEBS Lett. (1994) 349:23-28
#journal
#title Purification and characterization of the 210-amino acid
recombinant basic fibroblast growth factor form (FGF-2).
#cross-references MUID:94320639

#accession S46253
#molecule_type protein
#residues 39-53:65-88 #label PAT
#note recombinant gene expressed in Escherichia coli

GENETICS
#gene GDB:FGF2; FGFB
#cross-references GDB:119910; OMIM:134920
#map_position 4q25-4q27
#start_codon CTG
CLASSIFICATION
#superfamily fibroblast growth factor
KEYWORDS
alternative initiators; angiogenesis; growth factor; heparin
binding; mitogen

FEATURE
1-210 #product basic fibroblast growth factor, 22.5K form
#status predicted #label MA2\
65-210 #product basic fibroblast growth factor, 18K form
#status predicted #label MAT\
82-86 #region heparin binding #status predicted\
171-174 #region heparin binding #status predicted\
SUMMARY
#length 210 #molecular-weight 22623 #checksum 3610

Query Match 35.48; Score 509; DB 2; Length 210;
Best Local Similarity 54.5%; Pred. No. 1.86e-85;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

Db 79 GHFKDKRLKCKNGGFLRHPDGRVDGVRKSDPHKQLQAEERGVSIGVCANRYL 138
::: || || || || || || || || || || || || || || || || || || ||
QY 66 ANYKKPKLLKCSNGGHFLRLPDGTVDGTRDSQHLQLLSAESVGEVYIKSTETQYL 125

Db 139 AMKEDGRLLASKVTCDEFFERLESNNYTSRKYT--SWYVALKRTQYKLGSKTGP 196
|| || || || || || || || || || || || || || || || || || || ||
QY 126 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAENWFVGLKNGSKRGPRTHY 185

Db 197 GKAILFLPMSAKS 210
|||||||::: |
QY 186 GKAILFLPLPVSS 199

RESULT 13
ENTRY C37360 #type complete
TITLE basic fibroblast growth factor - mouse
ORGANISM #formal_name Mus musculus #common_name house mouse
DATE 17-Apr-1993 #sequence_revision 17-Apr-1993 #text_change
16-Jul-1999
ACCESSIONS C37360
REFERENCE A37360
#authors Hebert, J.M.; Basilico, C.; Goldfarb, M.; Haub, O.; Martin,
G.R.
#journal Dev. Biol. (1990) 138:454-463
#title Isolation of cDNAs encoding four mouse FGF family members and
characterization of their expression patterns during
embryogenesis.
#cross-references MUID:90201563
#accession C37360
#status preliminary
#molecule_type mRNA
#residues 1-154 #label HEB
#cross-references GB:M30644; NID:g193296; PIDN:AAA37621.1; PID:g309239
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY
#length 154 #molecular-weight 17153 #checksum 2906

Query Match 35.3%; Score 508; DB 2; Length 154;
Best Local Similarity 54.5%; Pred. No. 3.13e-85;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

Db 23 GHFKDKRLKCKNGGFLRHPDGRVDGVRKSDPHKQLQAEERGVSIGVCANRYL 82
::: || || || || || || || || || || || || || || || || || || ||
QY 66 ANYKKPKLLKCSNGGHFLRLPDGTVDGTRDSQHLQLLSAESVGEVYIKSTETQYL 125

Db 83 AMKEDGRLLASKVTCDEFFERLESNNYTSRKYS--SWYVALKRTQYKLGSKTGP 140
|| || || || || || || || || || || || || || || || || || || ||
QY 126 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAENWFVGLKNGSKRGPRTHY 185

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Db      141 GOKAIFLPMSAKS 154
      |||||||:|
QY      186 GOKAIFLPVSS 199

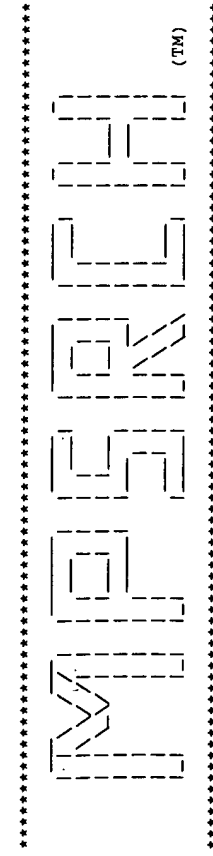
RESULT 14
ENTRY   #type complete
TITLE   basic fibroblast growth factor precursor - rat
ALTERNATE_NAMES bFGF
ORGANISM #formal_name Rattus norvegicus #common_name Norway rat
DATE     21-May-1990 #sequence_revision 21-May-1990 #text_change
      16-Jul-1999
ACCESSIONS A31674; S00876; S24309
REFERENCE   A31674
#authors   Shimasaki, S.; Emoto, N.; Koba, A.; Mercado, M.; Shibata, F.;
      Cooksey, K.; Baird, A.; Ling, N.
#journal   Biochem. Biophys. Res. Commun. (1988) 157:256-263
#title     Complementary DNA cloning and sequencing of rat ovarian basic
      fibroblast growth factor and tissue distribution study of
      its mRNA.
#cross-references MUID:89061721
#accession A31674
#molecule_type mRNA
##residues 1-154 ##label SHI
##cross-references GB:N22427; NID:G204285; PIDN:AAA41210.1; PID:G204286
REFERENCE S00876
#authors   Kurokawa, T.; Seno, M.; Igarashi, K.
#journal   Nucleic Acids Res. (1988) 16:5201
#title     Nucleotide sequence of rat basic fibroblast growth factor
      cDNA.
#cross-references MUID:88262516
#accession S00876
#molecule_type mRNA
##residues 1-154 ##label KUR
##cross-references EMBL:X07285; NID:G56203; PIDN:CAA30265.1; PID:G56204
REFERENCE S24309
#authors   El-Husseini, A.E.D.; Paterson, J.A.; Myal, Y.; Shiu, R.P.C.
#journal   Biochim. Biophys. Acta (1992) 1131:314-316
#title     PCR detection of the rat brain basic fibroblast growth factor
      (bFGF) mRNA containing a unique 3' untranslated region.
#cross-references MUID:92329546
#accession S24309
##status   preliminary; translation not shown
#molecule_type mRNA
##residues 35-154 ##label ELH
##cross-references EMBL:X61697; NID:G56143; PIDN:CAA43863.1; PID:G56144
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FEATURES
     ATURE
     1-9
     10-154
SUMMARY
     #domain signal sequence #status predicted #label sig\
     #product basic fibroblast growth factor #status
     predicted #label MAT
     #length 154 #molecular_weight 17139 #checksum 3026
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     Best Local Similarity 54.5%; Pred. No. 3,13e-85;
     Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

Db      23 GHFKDPKRYKNGGFFLIHPDGRVDGVRKSDPHVKLQLOAERGVSITKGVCANRYL 82
      :::| | | | | | | | | | | | | | | | | | | | | | | | | | | |
QY      66 ANKPKLLYCSNGGHFRLPDGTVGTRDSQHIQLQLSAESVGEVYIKSTETGYL 125
      :::| | | | | | | | | | | | | | | | | | | | | | | | | | | |
Db      83 AKKEDGRLLAKCVTECEFFERLESNNYTVSRKYS- -SWYVALRKTGOYKLGSKTGP 140
      || | | | | | | | | | | | | | | | | | | | | | | | | | |
QY      126 AMTDGLLYGSQTPNECFLERLEENHYNTYISKHAENWVGLKNGSKCRGRPTHY 185
      |||||||:|

Db      141 GOKAIFLPMSAKS 154
      |||||||:|
QY      186 GOKAIFLPVSS 199

RESULT 15
ENTRY   #type fragment
TITLE   S31622

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MPsrch\_pp protein - protein database search, using Smith-Waterman algorithm

on: Tue Aug 29 15:53:11 2000; MasPar time 7.86 Seconds  
Tabular output not generated. 788.874 Million cell updates/sec

Title: >US-09-121-017B-19  
Description: (1-200) from US09121017B.pep  
Perfect Score: 1438  
Sequence: 1 MAPARLFAILLFFVGVAES.....PRTHYGKAILFLPLPVSSD 200

Scoring table: PAM 150  
Gap 11

Searched: 85661 seqs, 30989116 residues

Post-processing: Minimum Match 0%  
Listing first 45 summaries

Database: swiss-prot38  
I:SWISSPROT

Statistics: Mean 45.099; Variance 70.202; scale 0.642

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description	Pred. No.
1	985	68.5	155	1	FGF1_HUMAN	HEPARIN-BINDING GROWTH 1.14e-221
2	967	67.2	155	1	FGF1_MESAU	HEPARIN-BINDING GROWTH 7.15e-217
3	966	67.2	155	1	FGF1_MOUSE	HEPARIN-BINDING GROWTH 1.32e-216
4	954	66.3	152	1	FGF1_PIG	HEPARIN-BINDING GROWTH 2.07e-213
5	917	63.8	155	1	FGF1_BOVIN	HEPARIN-BINDING GROWTH 1.45e-203
6	916	63.7	155	1	FGF1_CHICK	HEPARIN-BINDING GROWTH 2.66e-203
7	522	36.3	158	1	FGF2_CHICK	HEPARIN-BINDING GROWTH 3.42e-100
8	516	35.9	155	1	FGF2_SHEEP	HEPARIN-BINDING GROWTH 1.17e-98
9	516	35.9	155	1	FGF2_BOVIN	HEPARIN-BINDING GROWTH 1.17e-98
10	509	35.4	155	1	FGF2_MOUSE	HEPARIN-BINDING GROWTH 7.18e-97
11	508	35.3	154	1	FGF2_HUMAN	HEPARIN-BINDING GROWTH 1.29e-96
12	508	35.3	154	1	FGF2_RAT	HEPARIN-BINDING GROWTH 1.29e-96
13	498	34.6	156	1	FGF2_MONDO	HEPARIN-BINDING GROWTH 4.58e-94
14	493	34.3	155	1	FGF2_XENLA	HEPARIN-BINDING GROWTH 8.58e-93
15	466	32.4	137	1	FGF2_RABIT	HEPARIN-BINDING GROWTH 6.09e-86
16	448	31.2	198	1	SDC4_HUMAN	SYNDECAN-4 PRECURSOR ( 2.14e-81
17	360	25.0	209	1	FGF9_XENLA	GLIA-ACTIVATING FACTOR 1.72e-59
18	350	24.3	208	1	FGF9_MOUSE	GLIA-ACTIVATING FACTOR 4.85e-57
19	350	24.3	208	1	FGF9_HUMAN	GLIA-ACTIVATING FACTOR 4.85e-57
20	350	24.3	208	1	FGF9_RAT	GLIA-ACTIVATING FACTOR 4.85e-57
21	329	22.9	207	1	FGFG_HUMAN	FIBROBLAST GROWTH FACT 6.26e-52
22	324	22.5	207	1	FGFG_RAT	FIBROBLAST GROWTH FACT 1.01e-50
23	302	21.0	194	1	FGF7_SHEEP	KERATINOCYTE GROWTH FA 1.97e-45

RX MEDLINE: 92019819.  
RA Wang W.P., Quick D., Balcerzak S.P., Needleman S.W., Chiu I.M.;  
RT "Cloning and sequence analysis of the human acidic fibroblast growth  
RL factor gene and its preservation in leukemia patients.";  
RN Oncogene 6:1521-1529(1991).  
RX SEQUENCE FROM N.A.  
RP MEDLINE: 92202857.  
RA Li Y.L., Kha H., Golden J.A., Migchielsen A.A.J., Goetzl E.J.,  
RA Turk E.J.;  
RT "An acidic fibroblast growth factor protein generated by alternate  
RT splicing acts like an antagonist.";  
RL J. Exp. Med. 175:1073-1080(1992).  
RX SEQUENCE OF 1-154 FROM N.A.  
RP MEDLINE: 94069734.  
RA Zhao X.M., Yeh T.K., Hiebert M., Frist W.H., Miller G.G.;  
RT "The expression of acidic fibroblast growth factor (heparin-binding  
RT growth factor-1) and cytokine genes in human cardiac allografts and T  
RL cells";  
RN Transplantation 56:1177-1182(1993).  
RX SEQUENCE OF 1-40 FROM N.A.  
RP MEDLINE: 90365758.  
RA Crumley G., Dionne C.A., Jave M.;  
RT "The gene for human acidic fibroblast growth factor encodes two  
RT upstream exons alternatively spliced to the first coding exon.";  
RL Biochem. Biophys. Res. Commun. 171:7-13(1990).  
RX SEQUENCE OF 16-155.  
RP MEDLINE: 86296647.  
RA Harper J.W., Strydom D.J., Lobb R.R.;  
RT "Human class I heparin-binding growth factor: structure and homology  
RT to bovine acidic brain fibroblast growth factor.";  
RL Biochemistry 25:4097-4103(1986).  
RX SEQUENCE OF 16-155.  
RP MEDLINE: 87048871.  
RA Gautschi-Sova P., Mueller T., Boehlen P.;  
RT "Amino acid sequence of human acidic fibroblast growth factor.";  
RL Biochem. Biophys. Res. Commun. 140:874-880(1986).  
RX SEQUENCE OF 16-47.  
RP MEDLINE: 86186784.  
RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;  
RT "Human brain-derived acidic and basic fibroblast growth factors:  
RT amino terminal sequences and specific mitogenic activities.";  
RL Biochem. Biophys. Res. Commun. 135:541-548(1986).  
RX SEQUENCE OF 16-49.  
RP MEDLINE: 86275260.  
RA Gautschi P., Frater-Schroeder M., Boehlen P.;  
RT "Partial molecular characterization of endothelial cell mitogens from  
RT human brain: acidic and basic fibroblast growth factors";  
RL FEBS Lett. 204:203-207(1986).  
RX X-RAY CRYSTALLOGRAPHY (2.0 ANGSTROMS).  
RP MEDLINE: 96194129.  
RA Blaber M., Disalvo J., Thomas K.A.;  
RT "X-ray crystal structure of human acidic fibroblast growth factor.";  
RL Biochemistry 35:2086-2094(1996).  
RX STRUCTURE BY NMR OF 24-155.  
RP MEDLINE: 94358885.  
RA Pineda-Lucena A., Jimenez M.A., Nieto J.L., Santoro J., Rico M.,  
RA Gimenez-Gallego G.;  
RT "1H-NMR assignment and solution structure of human acidic fibroblast  
RT growth factor activated by inositol hexasulfate.";  
RN J. Mol. Biol. 242:81-98(1994).  
RX STRUCTURE BY NMR OF 24-155.  
RP MEDLINE: 97107535.  
RA Pineda-Lucena A., Jimenez M.A., Lozano R.M., Nieto J.L., Santoro J.,  
RA Rico M., Gimenez-Gallego G.;  
RT "Three-dimensional structure of acidic fibroblast growth factor in  
RT solution: effects of binding to a heparin functional analog.";  
RN J. Mol. Biol. 264:162-178(1996).  
RX STRUCTURE BY NMR OF 25-155.  
RP MEDLINE: 98387896.  
RA Lozano R.M., Jimenez M., Santoro J., Rico M., Gimenez-Gallego G.;  
RT "Solution structure of acidic fibroblast growth factor bound to 1,3,  
RT 6-naphthalenetrifluoride: a minimal model for the anti-tumoral  
RT action of suramin and suradistas.";  
RN J. Mol. Biol. 281:899-915(1998).  
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -!- SUBUNIT: MONOMER.  
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY  
CC THAN DOES BFGF.  
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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CC EMBL: M13361; AAA79245.1; -  
DR EMBL: X51943; CAA36206.1; -  
DR EMBL: M30492; AAA52446.1; -  
DR EMBL: M30490; AAA52446.1; JOINED.  
DR EMBL: M30491; AAA52446.1; JOINED.  
DR EMBL: M60515; AAA51672.1; -  
DR EMBL: M60516; AAA51673.1; -  
DR EMBL: M23087; AAA52638.1; -  
DR EMBL: M23086; AAA52638.1; JOINED.  
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DR EMBL: X65778; CAA46661.1; -  
DR PIR: A23553; A23553.  
DR PIR: A24243; A24243.  
DR PIR: A24301; A24301.  
DR PIR: A24682; A24682.  
DR PIR: A24820; A24820.  
DR PIR: A26386; A26386.  
DR PIR: A33665; A33665.  
DR PIR: S18217; S18217.  
DR PDB: 2AFG; 15-OCT-95.  
DR PDB: 1AXM; 22-APR-98.  
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DR PDB: 1RML; 11-NOV-98.  
DR MIM: 131220; -  
DR PFAM: PF00167; FGF; 1.  
DR PRINTS: PR00262; ILIHHGF.  
DR PRINTS: PR00263; HBGFFGF.  
DR PROSITE: PS00247; HBGFLFGF; 1.  
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3D-structure.  
FT PROPEP 1 15  
FT CHAIN 16 155 HEPARIN-BINDING GROWTH FACTOR 1.  
FT MOD\_RES 2 2 ACETYLATION  
FT BINDING 24 28 HEPARIN (POTENTIAL).  
FT BINDING 113 116 HEPARIN (POTENTIAL).  
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Db 70 YIKSTEGQVLAAMDGLLYGSQTPNEECFLERLEENHYNTYISKKAENWFGVGLKKN 129  
QY 115 YIKSTEGQVLAAMDGLLYGSQTPNEECFLERLEENHYNTYISKKAENWFGVGLKKN 174  
Db 130 GSKRGPRTHYGQKAILFLPLPVSSD 155  
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AC P10935;  
DT 01-JUL-1989 (Rel. 11, Created)  
DT 01-JUL-1989 (Rel. 11, Last sequence update)  
DT 15-JUL-1999 (Rel. 38, Last annotation update)  
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GN FGF1 OR FGF-1.  
OS Mesocricetus auratus (Golden hamster).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Cricetinae;  
OC Mesocricetus.  
[1]  
RP SEQUENCE FROM N.A.  
RX MEDLINE; 90270291.  
RA Hall J.A., Harris M.A., Malark M., Mansson P.E., Zhou H., Harris S.E.;  
RT "Characterization of the hamster DDT-1 cell aFGF/HBGF-I gene and CDNA  
and its modulation by steroids".  
RL J. Cell. Biochem. 43:17-26(1990).  
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -!- SUBUNIT: MONOMER.  
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY  
CC THAN DOES BFGF.  
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
CC PIR; A60721; A60721.  
DR HSSP; P05230; 2AXM.  
DR PFAM; PF00167; FGF; 1.  
DR PRINTS; PR00262; ILIHBGF.  
DR PROSITE; PS00247; HBGF\_FGF; 1.  
KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
FT PROPEP 1 15 BY SIMILARITY.  
FT CHAIN 16 155 HEPARIN-BINDING GROWTH FACTOR 1.  
FT BINDING 24 28 HEPARIN (POTENTIAL).  
FT BINDING 113 116 HEPARIN (POTENTIAL).  
SQ SEQUENCE 155 AA; 17403 MW; 41E5EC760E412CC5 CRC64;

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Best Local Similarity 97.0%; Pred. No. 7.13e-217;

Matches 131; Conservative 2; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHIQLSAESAGEVIKGTGTQYL 80  
QY 66 ANYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHIQLSAESAGEVIKGTGTQYL 125  
Db 81 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENWFGVGLKKNCKRGPRTHY 140  
QY 126 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENWFGVGLKKNCKRGPRTHY 185  
Db 141 GQKAILFLPLPVSSD 155  
QY 186 GQKAILFLPLPVSSD 200

RESULT 3 STANDARD; PRT; 155 AA.  
ID FGF1\_MOUSE  
AC P10935;  
DT 01-JUL-1989 (Rel. 11, Created)  
DT 01-JUL-1989 (Rel. 11, Last sequence update)  
DT 15-JUL-1999 (Rel. 38, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST  
DE GROWTH FACTOR) (AFGF).  
GN FGF1 OR FGF-1 OR FGFA.  
OS Mus musculus (Mouse), and Rattus norvegicus (Rat).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.  
[1]  
RP SEQUENCE FROM N.A.  
RX SPECIES-RAT;  
RX MEDLINE; 89240051.  
RA Goodrich S., Van G.C., Bahrenburg K., Mansson P.E.;  
RT "The nucleotide sequence of rat heparin binding growth factor 1  
(HBGF-1)".  
RL Nucleic Acids Res. 17:2867-2867(1989).  
RN [2]  
RP SEQUENCE FROM N.A.  
RX SPECIES-MOUSE;  
RX MEDLINE; 90201563.  
RA Hebert J.M., Basilico C., Goldfarb M., Haub O., Martin G.R.;  
RT "Isolation of cDNAs encoding four mouse FGF family members and  
RT characterization of their expression patterns during embryogenesis".  
RL Dev. Biol. 138:454-463(1990).  
RN [3]  
RP SEQUENCE FROM N.A.  
RX SPECIES-MOUSE;  
RX MEDLINE; 97128312.  
RA Madiai F., Hackshaw K.V., Chiu I.M.;  
RT "Cloning and characterization of the mouse Fgf-1 gene".  
RL Gene 179:231-236(1996).  
RN [4]  
RP SEQUENCE FROM N.A.  
RX SPECIES-MOUSE; STRAIN-BALB/C;  
RX MEDLINE; 97094746.  
RA Alam K.Y., Frosthalm A., Hackshaw K.V., Evans J.E., Rotter A.,  
Chiu I.M.;  
RT "Characterization of the 1B promoter of fibroblast growth factor 1  
and its expression in the adult and developing mouse brain".  
RL J. Biol. Chem. 271:30263-30271(1996).  
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
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CC EMBL; X14232; CAA32448.1; -  
DR EMBL; M30641; AAA37618.1; -  
DR EMBL; U36459; AAC52969.1; -  
DR EMBL; U36457; AAC52969.1; JOINED.  
DR EMBL; U36458; AAC52969.1; JOINED.  
DR EMBL; U67610; AAC52907.1; -  
DR PIR; S04147; SC4147.  
DR PIR; D37360; D37360.  
DR HSSP; P05230; 2AXM.  
DR MGD; MGI:95515; FGF1.  
DR PFAM; PF00167; FGF; 1.  
DR PRINTS; PR00262; ILIHBGF.

[illegible]



RA Crabb J.A., Armes L.G., Carr S.A., Johnson C.M., Roberts G.D.,  
 RA Bordoli F.S., McKeehan W.L.;  
 RT "Complete primary structure of prostastropin, a prostate epithelial  
 RT cell growth factor";  
 RL Biochemistry 25:4988-4993(1986).  
 RN [5]  
 RP SEQUENCE OF 16-155.  
 RX MEDLINE; 86070224.  
 RA Gineez-Gallego G., Rodkey J., Bennett C., Rios-Candelore M.,  
 RA Disalvo J., Thomas K.;  
 RT "Brain-derived acidic fibroblast growth factor: complete amino acid  
 RT sequence and homologies";  
 RL Science 235:1385-1388(1985).  
 RN [6]  
 RP SEQUENCE OF 16-44, AND COMPOSITION.  
 RX MEDLINE; 86055750.  
 RA Boehlen P., Esch F., Baird A., Gospodarowicz D.;  
 RT "Acidic fibroblast growth factor (FGF) from bovine brain:  
 RT amino-terminal sequence and comparison with basic FGF";  
 RL EMBO J. 4:1351-1355(1985).  
 RN [7]  
 RP SEQUENCE OF 16-56 FROM N.A.  
 RX MEDLINE; 86261806.  
 RA Abraham J.A., Mergia A., Whang J.L., Tunolo A., Friedman J.,  
 RA Hjerrild K.A., Gospodarowicz D., Fiddes J.C.;  
 RT "Nucleotide sequence of a bovine clone encoding the angiogenic  
 RT protein, basic fibroblast growth factor";  
 RL Science 233:545-548(1986).  
 RN [8]  
 RP SEQUENCE OF 16 45.  
 RX MEDLINE; 89231704.  
 RA Quinkler W., Malsberg M., Bernotat-Danielowski S., Luethe N.,  
 RA Sharma H.S., Schaper W.;  
 RT "Isolation of heparin-binding growth factors from bovine, porcine and  
 RT canine hearts";  
 RL Eur. J. Biochem. 181:67-73(1989).  
 RN [9]  
 RP SEQUENCE OF 1-18 FROM N.A.  
 RX MEDLINE; 91095983.  
 RA Philippe J.M., Renaud F., Desset S., Laurent M.;  
 RA Submitted (JUL-1992) to the EMBL/GenBank/DBJ databases.  
 RN [10]  
 RP X-RAY CRYSTALLOGRAPHY (3.0 ANGSTROMS).  
 RX MEDLINE; 91095983.  
 RA Zhu X., Komiya H., Chirino A., Faham S., Fox G.M., Arakawa T.,  
 RA Hsu B.T., Rees D.C.;  
 RT "Three-dimensional structures of acidic and basic fibroblast growth  
 RT factors";  
 RL Science 251:90-93(1991).  
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
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 CC EMBL; X13221; CAA31610.1;  
 CC EMBL; X14032; CAA32192.1;  
 CC EMBL; M35608; AAA30517.1;  
 CC EMBL; X66446; CAA47063.1;  
 CC EMBL; M97660; AAA30563.1;  
 CC EMBL; M97661; AAA30564.1;  
 CC PIR; A01385; GKBOA.

DR PIR; A25043; A25043.  
 DR PIR; B25043; B25043.  
 DR PIR; C25043; C25043.  
 DR PIR; A24477; A24477.  
 DR PIR; B24663; B24663.  
 DR PIR; S02102; S02102.  
 DR PDB; IBAR; 31-OCT-93.  
 DR PDB; IAF; 31-OCT-93.  
 DR PFAM; PF00167; FGF; 1.  
 DR PRINTS; PR00262; IL1HGF.  
 DR PRINTS; PR00263; HBGF.  
 DR PROSITE; PS00247; HBGF\_FGF; 1.  
 KW Growth factor; Mitogen; Vascularization; Heparin-binding; Acetylation;  
 KW 3D-structure.  
 FT PROPEP 1 15  
 FT CHAIN 2 155  
 FT CHAIN 16 155  
 FT CHAIN 22 155  
 FT MOD\_RES 2 2  
 FT BINDING 24 28  
 FT BINDING 113 116  
 FT STRAND 27 31  
 FT STRAND 32 34  
 FT STRAND 37 40  
 FT TURN 42 43  
 FT STRAND 46 49  
 FT HELIX 55 57  
 FT STRAND 59 61  
 FT STRAND 69 69  
 FT STRAND 71 73  
 FT STRAND 79 82  
 FT TURN 84 85  
 FT STRAND 87 91  
 FT HELIX 96 98  
 FT STRAND 100 100  
 FT STRAND 103 104  
 FT TURN 106 107  
 FT STRAND 110 111  
 FT STRAND 113 114  
 FT TURN 116 121  
 FT STRAND 123 123  
 FT STRAND 126 126  
 FT TURN 128 129  
 FT STRAND 132 132  
 FT STRAND 134 134  
 FT STRAND 135 137  
 FT HELIX 140 141  
 FT TURN 144 145  
 FT STRAND 147 150  
 SQ SEQUENCE 155 AA; 17493 MW; F636641F189F9BFD CRC64;  
 Query Match 63.88; Score 917; DB 1; Length 155;  
 Best Local Similarity 91.9%; Pred. No. 1.45e-203;  
 Matches 124; Conservative 6; Mismatches 5; Indels 0; Gaps 0;  
 Db 21 GNYKPKLYCSNGVFLRILPDGTVGDKDRSDQHQIQLCAESIGEVYIKSTGQFL 80  
 QY 66 ANKKPKLYCSNGVFLRILPDGTVGDKDRSDQHQIQLCAESIGEVYIKSTGQYL 125  
 Db 81 AMTDGLLYGSGTPNECLFLERLEENHYNTYISKKAHKHMFVGLKNGRSKLGPRTHF 140  
 QY 126 AMTDGLLYGSGTPNECLFLERLEENHYNTYISKKAHKHMFVGLKNGRSKRG RTHY 185  
 Db 141 GQKAILFLPLVSSD 155  
 QY 186 GQKAILFLPLVSSD 200  
 RESULT 6  
 ID FGFL\_CHICK STANDARD; PRT; 155 AA.  
 AC P19596;  
 DT 01-FEB-1991 (Rel. 17, Created)  
 DT 01-FEB-1996 (Rel. 33, Last sequence update)

15-JUL-1999 (Rel. 38, Last annotation update)  
 HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF) (ALPHA-ENDOTHELIAL CELL GROWTH FACTOR).  
 FGFI OR FGF-1.  
 OS Gallus gallus (Chicken).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Archosauria; Aves; Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 91347925.  
 RA Schnurch H., Risau W.;  
 RT "Differentiating and mature neurons express the acidic fibroblast growth factor gene during chick neural development.";  
 RL Development 111:1143-1154(1991).  
 RN [2]  
 RP SEQUENCE FROM N.A.  
 RA Martin G.R., Han J.K.;  
 RL Submitted (JUL-1995) to the EMBL/GenBank/DBJ databases.  
 RN [3]  
 RP SEQUENCE OF 22-48.  
 RX MEDLINE; 88296438.  
 RA Risau W., Gautschi-Sova P., Boehlen P.;  
 RT "Endothelial cell growth factors in embryonic and adult chick brain are related to human acidic fibroblast growth factor.";  
 RL EMBO J. 7:959-962(1988).  
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.  
 CC -!- SUBUNIT: MONOMER.  
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY THAN DOES BGF.  
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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 DR EMBL; S63263; AAB19629.1; -;  
 DR EMBL; U31863; AAB80310.1; -;  
 DR EMBL; S63261; AAD13942.1; -;  
 DR FIR; S02633; S02639.  
 DR HSP; P05230; 2AXM.  
 DR PFAM; PF00167; FGF; 1.  
 DR PRINTS; PR00262; ILIHBGF.  
 DR PRINTS; PR00263; HGFEGF.  
 DR PROSITE; PS00247; HBGF\_FGF; 1.  
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
 FT PROPEP 1 15  
 FT CHAIN 16 155  
 FT CHAIN 22 155  
 FT BINDING 24 28  
 FT BINDING 113 116  
 FT SEQUENCE 155 AA; 17322 MW; 8EDB70545E2B4365 CRC64;  
 Query Match 63.7%; Score 916; DB 1; Length 155;  
 Best Local Similarity 90.4%; Pred. No. 2.66e-203;  
 Matches 122; Conservative 6; Mismatches 7; Indels 0; Gaps 0;  
 Db 21 GNYKPKLLYCSNGHFLRILPDGKVDGTRSDQHIQLQLSAEDVGEVYKSTASGOYL 80  
 QY 66 ANYKPKLLYCSNGHFLRILPDGKVDGTRSDQHIQLQLSAEDVGEVYKSTASGOYL 125  
 Db 81 AMDTGLLYGSLQPCNECLFLERLEENHNTYISKKHADKNWFWGLKNGSKGPRTHY 140  
 QY 126 AMDTGLLYGSLQPCNECLFLERLEENHNTYISKKHAEKNWFWGLKNGSKGPRTHY 185  
 Db 141 GQKAILFLPLPSAD 155

186 GQKAILFLPLPSAD 200  
 RESULT 7  
 ID FGF2-CHICK STANDARD; PRT; 158 AA.  
 AC P48800;  
 DT 01-FEB-1996 (Rel. 33, Created)  
 DT 01-FEB-1996 (Rel. 33, Last sequence update)  
 DT 01-FEB-1996 (Rel. 33, Last annotation update)  
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF).  
 GN FGF2 OR FGF-2.  
 OS Gallus gallus (Chicken).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Archosauria; Aves; Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 93246053.  
 RA Borja A.Z., Zeller R., Meijers C.;  
 RT "Expression of alternatively spliced BFGF first coding exons and antisense mRNAs during chicken embryogenesis.";  
 RL Dev. Biol. 157:110-118(1993).  
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.  
 CC -!- SUBUNIT: MONOMER.  
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES AFGF.  
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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 DR EMBL; M95707; AAA48617.1; -;  
 DR HSP; P09038; 1BFF.  
 DR PFAM; PF00167; FGF; 1.  
 DR PRINTS; PR00262; ILIHBGF.  
 DR PRINTS; PR00263; HGFEGF.  
 DR PROSITE; PS00247; HBGF\_FGF; 1.  
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
 FT PROPEP 1 12  
 FT CHAIN 13 158  
 FT BINDING 30 34  
 FT BINDING 119 122  
 FT SEQUENCE 158 AA; 17374 MW; 7B69B684C1F1816 CRC64;  
 Query Match 36.3%; Score 522; DB 1; Length 158;  
 Best Local Similarity 54.5%; Pred. No. 3.42e-100;  
 Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;  
 Db 27 GHFKDPRKLYCKNGFFLRINPDGKVDGTRSDQHIQLQLSAEDVGEVYKSTASGOYL 86  
 QY 66 ANYKPKLLYCSNGHFLRILPDGKVDGTRSDQHIQLQLSAEDVGEVYKSTASGOYL 125  
 Db 87 AMKEDGRLALKACATECEFFERLESNNYTSRKYSD--WYVALKRTGQYKPGKPTGP 144  
 QY 126 AMDTGLLYGSLQPCNECLFLERLEENHNTYISKKHAEKNWFWGLKNGSKGPRTHY 185  
 Db 145 GQKAILFLPLPSAKS 158  
 QY 186 GQKAILFLPLPVS 199  
 RESULT 8  
 ID FGF2-SHEEP STANDARD; PRT; 155 AA.



VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.

CC -!- SUBUNIT: MONOMER.

CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES AFGF.

CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.

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CC -----

DR EMBL: M13440; AAX30518.1; .

DR PIR: A24663; GKBOB.

DR PIR: A24819; A24819.

DR PIR: A32878; A32878.

DR PDB: 1BAS; 31-OCT-93.

DR PFAM: PF00167; FGF; 1.

DR PRINTS: PR00262; ILHBBG.

DR PRINTS: PR00263; HBGF.FGF.

DR PROSITE: PS00247; HBGF\_FGF; 1.

KW Growth factor; Mitogen; Vascularization; Heparin-binding; 3D-structure.

FT PROPEP 1 9

FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.

FT CHAIN 25 155 KIDNEY-DERIVED GROWTH FACTOR.

FT SITE 46 48 CELL ATTACHMENT SITE (POTENTIAL).

FT SITE 88 90 CELL ATTACHMENT SITE (POTENTIAL).

FT BINDING 27 31 HEPARIN (POTENTIAL).

FT BINDING 116 119 HEPARIN (POTENTIAL).

FT STRAND 30 34

FT TURN 35 38

FT STRAND 39 43

FT TURN 45 46

FT STRAND 49 52

FT TURN 55 56

FT HELIX 58 60

FT STRAND 62 68

FT TURN 69 70

FT STRAND 71 76

FT TURN 77 80

FT STRAND 81 85

FT TURN 87 88

FT STRAND 91 94

FT HELIX 99 101

FT STRAND 103 107

FT TURN 109 110

FT STRAND 113 117

FT TURN 121 122

FT STRAND 124 124

FT TURN 127 127

FT STRAND 129 130

FT STRAND 133 133

FT HELIX 136 138

FT TURN 141 142

FT HELIX 144 146

FT STRAND 148 151

SQ SEQUENCE 155 AA; 17250 MW; BE6CE70FA6107129 CRC64;

Query Match 35.9%; Score 516; DB 1; Length 155;

Best Local Similarity 55.2%; Pred. No. 1.17e-98;

Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;

DB 24 GHFKDPKRLKNGGFFLRHPDGRVDGVRKSDPHIKLQLOAEERGVYSIRGVCANRYL 83

QY 66 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDSQHQIQLSAESVGEYVIRKSTEGQYL 125

DB 84 AMKEDGRLLASKVTCDECFERLENNYNTVRSRYS--SWYVALKRTGQYKLGPKTGP 141

QY 126 AMDTDGLYGSQTPNECLFLERLEENHYNTYISKHAEKNFWGLKNGSKRGPRTHY 185

DB 142 GOKAILFLPMSAKS 155

QY 186 GOKAILFLPLPVSS 199

RESULT 10

ID FGF2 HUMAN STANDARD; PRT; 155 AA.

AC P05038;

DT 01-NOV-1988 (Rel. 09, Created)

DT 01-NOV-1988 (Rel. 09, Last sequence update)

DT 01-NOV-1997 (Rel. 35, Last annotation update)

DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF) (PROSTATROPIN).

DE FGF2 OR FGF8.

GN Homo sapiens (Human).

OS Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.

OC [1]

RN RP SEQUENCE FROM N.A.

RX MEDLINE; 87053817.

RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Friedman J., Gospodarowicz D., Fiddes J.C.;

RA "Human basic fibroblast growth factor: nucleotide sequence and genomic organization."

RT "Human basic fibroblast growth factor: nucleotide sequence and genomic organization."

RL EMBO J. 5:2523-2528(1986).

RN [2]

RP SEQUENCE FROM N.A.

RX MEDLINE; 87217066.

RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Fiddes J.C.;

RA "Human basic fibroblast growth factor: nucleotide sequence, genomic organization, and expression in mammalian cells."

RL Cold Spring Harb. Symp. Quant. Biol. 51:657-668(1986).

RN [3]

RP SEQUENCE FROM N.A.

RX MEDLINE; 87213238.

RA Sommer A., Brewer M.T., Thompson R.C., Moscatelli D., Presta M., Rifkin D.B.;

RA "A form of human basic fibroblast growth factor with an extended amino terminus."

RL Biochem. Biophys. Res. Commun. 144:543-550(1987).

RN [4]

RP SEQUENCE FROM N.A.

RX MEDLINE; 87162468.

RA Kurokawa T., Sasada R., Iwano M., Igarashi K.;

RA "Cloning and expression of cDNA encoding human basic fibroblast growth factor."

RL FEBS Lett. 213:189-194(1987).

RN [5]

RP SEQUENCE FROM N.A.

RX MEDLINE; 89184522.

RA Prats H., Kaghad M., Prats A.C., Klagsbrun M., Lelias J.M., Liauzun P., Chalou P., Tauber J.P., Amalric F., Smith J.A., Caput D.;

RA "High molecular mass forms of basic fibroblast growth factor are initiated by alternative CUG codons."

RL Proc. Natl. Acad. Sci. U.S.A. 86:1836-1840(1989).

RN [6]

RP SEQUENCE OF 10-35.

RX MEDLINE; 86275260.

RA Gautschi P., Frater-Schroeder M., Boehlen P.;

RA "Partial molecular characterization of endothelial cell mitogens from human brain: acidic and basic fibroblast growth factors."

RL FEBS Lett. 204:203-207(1986).

RN [7]

RP SEQUENCE OF 10-39.

RX MEDLINE; 86186784.

RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;

RA "Human brain-derived acidic and basic fibroblast growth factors: amino terminal sequences and specific mitogenic activities."

RL Biochem. Biophys. Res. Commun. 135:541-548(1986).

RN [8]

RP SEQUENCE OF 2-22.

RX MEDLINE; 87156686.  
 RA Story M.T., Esch F., Shimasaki S., Sasse J., Jacobs S.C., Lawson R.K.;  
 RT "Amino-terminal sequence of a large form of basic fibroblast growth  
 factor isolated from human benign prostatic hyperplastic tissue.";  
 RL Biochem. Biophys. Res. Commun. 142:702-709(1987).  
 RN [9]  
 RP X-RAY CRYSTALLOGRAPHY (2.2 ANGSTROMS).  
 RX MEDLINE; 91195367.  
 RA Eriksson A.E., Cousins L.S., Weaver L.H., Matthews B.W.;  
 RT "Three-dimensional structure of human basic fibroblast growth  
 factor.";  
 RL Proc. Natl. Acad. Sci. U.S.A. 88:3441-3445(1991).  
 RN [10]  
 RP X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).  
 RX MEDLINE; 94004464.  
 RA Eriksson A.E., Cousins L.S., Matthews B.W.;  
 RT "Refinement of the structure of human basic fibroblast growth factor  
 at 1.6-A resolution and analysis of presumed heparin binding sites by  
 selenate substitution.";  
 RL Protein Sci. 2:1274-1284(1993).  
 RN [11]  
 RP X-RAY CRYSTALLOGRAPHY (1.8 ANGSTROMS).  
 RX MEDLINE; 91195368.  
 RA Zhang J., Cousins L.S., Barr P.J., Sprang S.R.;  
 RT "Three-dimensional structure of human basic fibroblast growth factor,  
 a structural homolog of interleukin 1 beta.";  
 RL Proc. Natl. Acad. Sci. U.S.A. 88:3446-3451(1991).  
 RN [12]  
 RP X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).  
 RX MEDLINE; 92121151.  
 RA Ago H., Kitagawa Y., Fujishima A., Matsuura Y., Katsube Y.;  
 RT "Crystal structure of basic fibroblast growth factor at 1.6-A  
 resolution.";  
 RL J. Biochem. 110:360-363(1991).  
 RN [13]  
 RP X-RAY CRYSTALLOGRAPHY (2.8 ANGSTROMS).  
 RX MEDLINE; 91095983.  
 RA Zhu X., Komiya H., Chirino A., Faham S., Fox G.M., Arakawa T.,  
 RT Hsu B.T., Rees D.C.;  
 RL "Three-dimensional structures of acidic and basic fibroblast growth  
 factors.";  
 RL Science 251:90-93(1991).  
 RN [14]  
 RP STRUCTURE BY NMR.  
 RX MEDLINE; 97040521.  
 RA Moy F.J., Seddon A.P., Boehlen P., Powers R.;  
 RT "High-resolution solution structure of basic fibroblast growth factor  
 determined by multidimensional heteronuclear magnetic resonance  
 spectroscopy.";  
 RL Biochemistry 35:13552-13561(1996).  
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
 CC -!- SUBUNIT: MONOMER.  
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES  
 CC AFGF.  
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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 CC -----  
 DR EMBL; M17599; AAA52534.1; ALT\_INIT.  
 DR EMBL; X04431; CAA28027.1; -.  
 DR EMBL; X04432; CAA28028.1; -.  
 DR EMBL; X04433; CAA28029.1; -.  
 DR EMBL; M27968; AAA52448.1; -.  
 DR EMBL; J04513; AAA52533.1; ALT\_INIT.

DR PIR; A25824; A25824.  
 DR PIR; A26642; A26642.  
 DR PIR; B24243; B24243.  
 DR PIR; B24301; B24301.  
 DR PIR; B32878; B32878.  
 DR PIR; S00297; S00297.  
 DR PDB; 2FGF; 15-APR-92.  
 DR PDB; 4FGF; 15-JUL-93.  
 DR PDB; 1FGA; 15-JUL-93.  
 DR PDB; 1BFB; 03-APR-96.  
 DR PDB; 1BFC; 03-APR-96.  
 DR PDB; 1BFF; 16-JUN-97.  
 DR PDB; 1BFG; 31-JAN-94.  
 DR PDB; 2BFF; 30-APR-94.  
 DR PDB; 1BLA; 08-NOV-96.  
 DR PDB; 1BLD; 08-NOV-96.  
 DR MIM; 134920; -.  
 DR PFAM; PF00167; FGF; 1.  
 DR PRINTS; PR00262; ILIHGFGF.  
 DR PRINTS; PR00263; HBGFFGFGF.  
 DR PROSITE; PS00247; HBGFG\_FGF; 1.  
 KW Growth factor; Mitogen; Vascularization; Heparin-binding;  
 KW 3D-structure.  
 FT PROPEP 1 9  
 FT CHAIN 10 155  
 FT SITE 46 48  
 FT SITE 88 90  
 FT BINDING 27 31  
 FT BINDING 116 119  
 FT STRAND 30 34  
 FT TURN 35 38  
 FT STRAND 39 43  
 FT TURN 45 46  
 FT STRAND 49 52  
 FT TURN 55 56  
 FT HELIX 58 60  
 FT STRAND 62 66  
 FT TURN 69 70  
 FT STRAND 71 76  
 FT TURN 77 80  
 FT STRAND 81 85  
 FT TURN 87 88  
 FT STRAND 91 94  
 FT HELIX 99 101  
 FT STRAND 103 107  
 FT TURN 109 110  
 FT STRAND 113 117  
 FT TURN 121 122  
 FT STRAND 124 124  
 FT STRAND 127 127  
 FT TURN 129 130  
 FT STRAND 132 133  
 FT STRAND 136 138  
 FT TURN 141 142  
 FT HELIX 144 146  
 FT STRAND 148 152  
 SQ SEQUENCE 155 AA; 17254 MW; BE6CE13373007129 CRC64;  
 Query Match 35.4%; Score 509; DB 1; Length 155;  
 Best Local Similarity 54.5%; Pred. No. 7.18e-97;  
 Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;  
 Db 24 GHFKDKRLKCKNGGFLRTHPDGRVDGVRKSPDHKLQLOAERGVSIGKVCANRYL 83  
 Qy 66 ANYKKRLLYCNGHGFLRLPDGTVDGTRSDQHLQLLSAESVGEVIYKTKETGOYL 125  
 Db 84 AMKEDGRLLASKCVTDCEFFERLESNNYTYRSRYT--SWYVALKRTQYKLGSKTGP 141  
 Qy 126 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAENWFVGLKNGSKRGPRTHY 185  
 Db 142 GQKAILFLPWSAKS 155  
 Qy 186 GQKAILFLPVS 199

```
RESULT 11
ID FGF2_MOUSE STANDARD; PRT; 154 AA.
AC P15655;
DT 01-APR-1990 (Rel. 14, Created)
DT 01-APR-1990 (Rel. 14, Last sequence update)
DT 01-FEB-1996 (Rel. 33, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
GN GROWTH FACTOR) (BFGF) (PROSTATROPIN).
DE FGF2 OR FGF-2.
OS Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 90201563.
RA Hebert J.M., Basilico C., Goldfarb M., Haub O., Martin G.R.;
"Isolation of cDNAs encoding four mouse FGF family members and
characterization of their expression patterns during embryogenesis.";
Dev. Biol. 138:454-463(1990).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
AFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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or send an email to license@isb-sib.ch).
CC EMBL; M30644; AAA37621.1; -
DR PIR; C37360; C37360.
DR HSSP; P09038; 1BFF.
DR MGD; MGI:95516; FGF2.
DR PFAM; PF00167; FGF.
DR PRINTS; PR00262; ILJHBGF.
DR PRINTS; PR00263; HBGF.
DR PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 9
FT CHAIN 10 154 HEPARIN-BINDING GROWTH FACTOR 2.
FT BINDING 26 30 HEPARIN (POTENTIAL).
FT BINDING 115 118 HEPARIN (POTENTIAL).
SQ SEQUENCE 154 AA; 17153 MW; 689F677416274388 CRC64;

Query Match 35.38; Score 508; DB 1; Length 154;
Best Local Similarity 54.58; Pred. No. 1.29e-96;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;

Db 23 GHFKDKPKRYCKNGGFFLRHPDGRVDGKRESDPHVKLQQAERGVYSIKGVCANRYL 82
::: || || || || || || || || || || || || || || || || || || || ||
QY 66 ANKKPKLLYCSNGGHFLRLPDGTVDRDRSDQHQLQLSAESVGEVYIKSTGRQYL 125

Db 83 AKMEDGELLASKCVTECEFFERLESNNYTYRSKYS--SWYALKRTGQYKLGSKTGP 140
|| || || || || || || || || || || || || || || || || || || || ||
QY 126 AMDTDGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFEVLKNGKSGRGPRTY 185

Db 141 GQKAILFLPMSKS 154
|||||||
QY 186 GQKAILFLPVS 199

RESULT 12
ID FGF2_RAT STANDARD; PRT; 154 AA.
AC P13109;
DT 01-JAN-1990 (Rel. 13, Created)
DT 01-JAN-1990 (Rel. 13, Last sequence update)
DT 15-JUL-1998 (Rel. 36, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
GN GROWTH FACTOR) (BFGF) (PROSTATROPIN).
GN FGF2 OR FGF-2.
OS Rattus norvegicus (Rat).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.
RN [1]
RP SEQUENCE FROM N.A.
RX STRAIN-SPRAGUE-DAWLEY; TISSUE-OVARY;
RX MEDLINE; 89061721.
RA Shimasaki S., Emoto N., Koba A., Mercado M., Shibata F.,
Cooksey K., Baird A., Ling N.;
"Complementary DNA cloning and sequencing of rat ovarian basic
fibroblast growth factor and tissue distribution study of its mRNA.";
Biochem. Biophys. Res. Commun. 157:256-263(1988).
RN [2]
RP SEQUENCE FROM N.A.
RX TISSUE-BRAIN;
RX MEDLINE; 88262516.
RA Kurokawa T., Seno M., Igarashi K.;
"Nucleotide sequence of rat basic fibroblast growth factor cDNA.";
Nucleic Acids Res. 16:5201-5201(1988).
RN [3]
RP SEQUENCE OF 1-28 FROM N.A.
RX STRAIN-SPRAGUE-DAWLEY; TISSUE-TESTIS;
RX MEDLINE; 97200905.
RA Pasumarthi K.B.S., Jin Y., Cattini P.A.;
"Cloning of the rat fibroblast growth factor-2 promoter region and
its response to mitogenic stimuli in glioma C6 cells.";
J. Neurochem. 68:898-908(1997).
RN [4]
RP SEQUENCE OF 35-154 FROM N.A.
RX STRAIN-SPRAGUE-DAWLEY; TISSUE-BRAIN;
RX MEDLINE; 92329546.
RA El-Husseini A.E.D., Paterson J.A., Myal Y., Shiu R.P.C.;
"PCR detection of the rat brain basic fibroblast growth factor (bFGF)
mRNA containing a unique 3' untranslated region.";
Biochim. Biophys. Acta 1131:314-316(1992).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- TISSUE SPECIFICITY: FOUND IN ALL THE TISSUES EXAMINED.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
AFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
CC This SWISS-PROT entry is copyright. It is produced through a collaboration
between the Swiss Institute of Bioinformatics and the EMBL outstation -
the European Bioinformatics Institute. There are no restrictions on its
use by non-profit institutions as long as its content is in no way
modified and this statement is not removed. Usage by and for commercial
entities requires a license agreement (See http://www.isb-sib.ch/announce/
or send an email to license@isb-sib.ch).
CC EMBL; M22427; AAA41210.1; -
DR EMBL; X07285; CAA30265.1; -
DR EMBL; U78079; AAC53225.1; -
DR EMBL; X61697; CAA43863.1; -
DR PIR; S00876; S00876.
DR PIR; A31674; A31674.
DR HSSP; P09038; 1BFF.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00262; ILJHBGF.
DR PRINTS; PR00263; HBGF.
DR PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 9
FT CHAIN 10 154 HEPARIN-BINDING GROWTH FACTOR 2.
```

Query Match	34.6%	Score 498;	DB 1;	Length 156;
Best Local Similarity	54.5%	Pred. No. 4.58e-94:		





Sult No.	Score	Query Match	Length	ID	Description	Pred. No.
1	511	35.5	130	6	O77767	2 70e-100
2	509	35.4	196	4	P78443	21 KD BASIC FIBROBLAST
3	382	26.6	101	13	P79706	BASIC FGF (FRAGMENT)
4	346	24.1	146	13	Q67659	FIBROBLAST GROWTH FACT
5	313	21.8	115	11	Q60487	BASIC FIBROBLAST GROWTH
6	301	20.9	194	6	P79150	KERATINOCYTE GROWTH FA
7	298	20.7	212	13	O42407	FIBROBLAST GROWTH FACT
8	274	19.1	252	11	O80966	PHF-4B.
9	266	18.5	60	4	Q16588	ACIDIC FIBROBLAST GROW
10	265	18.4	59	4	Q16089	ACIDIC FIBROBLAST GROW
11	264	18.4	70	11	O54837	FIBROBLAST GROWTH FACT
12	261	18.2	198	11	O35988	RYUPOCAN CORE PROTEIN
13	260	18.1	196	13	Q9RH31	POTATIVE FIBROBLAST GR
14	259	18.0	206	13	Q9G6D8	FIBROBLAST GROWTH FACT
15	257	17.9	243	13	Q9W6A1	FIBROBLAST GROWTH FACT
16	251	17.5	127	4	Q9Y9517	FIBROBLAST GROWTH FACT
17	248	17.2	192	4	Q95830	FIBROBLAST GROWTH FACT
18	248	17.2	245	13	Q9W6A2	FIBROBLAST GROWTH FACT
19	236	16.4	200	13	P79925	FIBROBLAST GROWTH FACT
20	226	15.7	435	5	O76831	LET-756 PROTEIN.



```
OC Eutheria; Rodentia; Hystricognathi; Caviidae; Cavia.
RN [1]
RP SEQUENCE FROM N.A.
RC TISSUE=PROSTATE;
RA RICCIARDELLI C.;
RL Submitted (JAN-1996) to the EMBL/GenBank/DBJ databases.
DR EMBL; L75974; AA85394.1; -.
DR HSSP; P09038; 2BPH.
DR PROSITE; PS00247; HBG_FGF; 1.
DR PFAM; PF00167; FGF; 1.
FT NON_TER 1
SQ SEQUENCE 115 AA; 13495 MW; 4B12914A CRC32;

Query Match      21.8%; Score 313; DB 11; Length 115;
Best Local Similarity 44.6%; Pred. No. 1.36e-49;
Matches 45; Conservative 22; Mismatches 31; Indels 3; Gaps 2;

Db 1 GFLRLHPDGRVDGVEKDPHKKHFKPA-BELCYQSLSNRYLAMKEDGRLASKCV 59
80 GHFLRLPDGTVDRSDQHIQLQLSAESVGEVYIKSTGTQYLAMDITDGLLYGSQTP 139
60 TDCFEFFERLESNNYNTYRSKYS--SWYVALKRTGYKLG 98
140 NEECLFLERLEENHYNTYISKHAEKNWFLGLKNGSKRG 180

RESULT 6
ID P79150 PRELIMINARY; PRT; 194 AA.
AC P79150;
DT 01-MAY-1997 (TRENBLrel. 03, Created)
DT 01-MAY-1997 (TRENBLrel. 03, Last sequence update)
DT 01-NOV-1999 (TRENBLrel. 12, Last annotation update)
DE KERATINOCYTE GROWTH FACTOR.
OS Canis familiaris (Dog).
OC Eukaryota; Metazoa; Chordata; Cranialata; Vertebrata; Mammalia;
OC Eutheria; Carnivora; Fissipedia; Canidae; Canis.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 96226403.
RA CANATAN H., CHANG W.Y., SUGIMOTO Y., SHIDAIFAT F., KULP S.K.,
RA BRUGGEMEIER R.W., LIN Y.C.;
RT "keratinocyte growth factor (KGF/FGF-7) has a paracrine role in canine
RT prostate: molecular cloning of mRNA encoding canine KGF.";
RL DNA Cell Biol. 15:247-254(1996).
DR EMBL; U80800; AAB38972.1; -.
DR HSSP; P05230; 2AFG.
DR PROSITE; PS00247; HBG_FGF; 1.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00262; ILLHBGF.
DR PRINTS; PR00263; HBGFFGF.
SQ SEQUENCE 194 AA; 22476 MW; 2B71A8ED CRC32;

Query Match      20.9%; Score 301; DB 6; Length 194;
Best Local Similarity 38.6%; Pred. No. 1.25e-46;
Matches 49; Conservative 28; Mismatches 47; Indels 3; Gaps 3;

Db 69 LFCRTO-WYLRDKRCKVKGTOEMKNSYNTMEIRTVAGIVATKGYSEYILAMNKEGKL 127
74 LYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVYIKSTGTQYLAMDITDGLL 133
128 YAKKECNECDNFKELEENHYNTYASAKWTHSGGEMFVALNQKGVFVRGKTKKEQRTAH 187
134 YGSOTPNEECLFLERLEENHYNTYIS-K-KHAEKNWFLGLKNGSKRGPRTHYGOKAIL 191
188 FLPLMAIT 194
192 FLPLPVS 198

RESULT 7
ID O42407 PRELIMINARY; PRT; 212 AA.
AC O42407;
DT 01-JAN-1998 (TRENBLrel. 05, Created)
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DT 01-JUN-1998 (TRENBLrel. 06, Last sequence update)
DT 01-NOV-1999 (TRENBLrel. 12, Last annotation update)
DE FIBROBLAST GROWTH FACTOR 10.
OS Gallus gallus (Chicken).
OC Eukaryota; Metazoa; Chordata; Cranialata; Vertebrata; Archosauria; Aves;
OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 97330690.
RA OHUCHI H., NAKAGAWA T., YAMAMOTO A., ARAGA A., OHTA T., ISHIMARU Y.,
RA YOSHIOKA H., KUWANA T., NOHNO T., YAMASAKI M., ITOH N., NOJI S.;
RT "The mesenchymal factor, Fgf10, initiates and maintains the outgrowth
RT of the chick limb bud through interaction with FGF8, an apical
RT ectodermal factor.";
RL Development 124:2235-2244(1997).
DR EMBL; D86333; BAA24945.1; -.
DR HSSP; P03968; IBAR.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00263; HBGFFGF.
SQ SEQUENCE 212 AA; 23631 MW; C8AB1883 CRC32;

Query Match      20.7%; Score 298; DB 13; Length 212;
Best Local Similarity 32.1%; Pred. No. 6.80e-46;
Matches 63; Conservative 47; Mismatches 76; Indels 10; Gaps 10;

Db 22 LLLFLVSVVVTCHDLQDMLSPATNSSSSSSSFSSPSSAGRHVRSYN-HLQGD 80
9 LLLFFVGVAESIRE-T-EVIDPDQLLEGRYFSGALSD-EDVVGPGQSDDFELSGSD 65
81 VR-KR-KL-Y-SYNYFLKIEKNGKVSQTKKENCPSILEITSIVGVVAVKSIKNYL 136
66 ANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEVYIKSTGTQYL 125
137 ANKKGKGVYKEFNSDKLKERIEENGYNTYASLWVHNGROMFVALNGRATRGOKT 196
126 AMDTDGLLYGSQTPNEECLFLERLEENHYNTYIS-K-KHAEKNWFLGLKNGSKRGPR 183
197 RRKNTSAHFPLPMVMS 212
184 HYGQRAILFLPLPVS 199

RESULT 8
ID O89096 PRELIMINARY; PRT; 252 AA.
AC O89096;
DT 01-NOV-1998 (TRENBLrel. 08, Created)
DT 01-NOV-1998 (TRENBLrel. 08, Last sequence update)
DT 01-NOV-1999 (TRENBLrel. 12, Last annotation update)
DE FHF-4B.
OS Rattus norvegicus (Rat), and Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Cranialata; Vertebrata; Mammalia;
OC Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 98267141.
RA YAMAMOTO S., MIKAMI T., OHBAYASHI N., OHTA M., ITOH N.;
RT "Structure and expression of a novel isoform of mouse FGF homologous
RT factor (FHF)-4.";
RL Biochim. Biophys. Acta 1398:38-41(1998).
DR EMBL; AB008908; BAA31544.1; -.
DR EMBL; AB008907; BAA31543.1; -.
DR HSSP; P03968; IBAR.
DR PROSITE; PS00247; HBG_FGF; 1.
DR PFAM; PF00167; FGF; 1.
SQ SEQUENCE 252 AA; 28364 MW; 1DFD5B4B CRC32;

Query Match      19.1%; Score 274; DB 11; Length 252;
Best Local Similarity 37.5%; Pred. No. 4.83e-40;
Matches 48; Conservative 26; Mismatches 49; Indels 5; Gaps 3;

Db 80 LYCROG-YLQMHHPDGLDGTDKDSTNSTFLNLPVGLRVVAIQGVTKGLYIANGEGYL 138
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Search completed: Tue Aug 29 15:55:23 2000  
Job time : 92 secs.



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WORLD  
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(TM)

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MPSrch\_pp protein - protein database search, using Smith-Waterman algorithm  
on: Tue Aug 29 16:00:07 2000; MasPar time 8.79 Seconds  
684.604 Million cell updates/sec  
bular output not generated.

Title: >US-09-121-017B-21  
Description: (1-754) from US09121017B.pap  
Perfect Score: 1813  
Sequence: 1 MAPARLALLFFVGVAVES.....PRTHYGQKAILFLPLPVSSD 254

Scoring table: PAM 150  
Gap 11

Searched: 188963 seqs, 23686106 residues

Post-processing: Minimum Match 0%  
Listing first 45 summaries

Database: a-geneseq36  
1:geneseq

Statistics: Mean 32.851; Variance 142.196; scale 0.231

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Match	Length	ID	Description	Pred. No.
1	989	54.6	140	1	R25914 Human acidic fibroblas	1.80e-82
2	989	54.6	140	1	R34437 Human acidic fibroblas	1.80e-82
3	989	54.6	140	1	P90068 Human acid fibroblast	1.80e-82
4	989	54.6	140	1	R74647 Human recombinant aFGF	1.80e-82
5	989	54.6	140	1	W04806 Human acidic fibroblas	1.80e-82
6	989	54.6	140	1	P70995 Sequence of human prot	1.80e-82
7	989	54.6	141	1	R10527 Human acidic fibroblas	1.80e-82
8	989	54.6	151	1	R05789 Human aFGF encoded by	1.80e-82
9	989	54.6	151	1	W92283 Human beta-endothelial	1.80e-82
10	989	54.6	154	1	W04805 Human beta-endothelial	1.80e-82
11	989	54.6	154	1	W06816 Human endothelial cell	1.80e-82
12	989	54.6	154	1	W75414 Human beta-endothelial	1.80e-82
13	989	54.6	155	1	P94037 Human acidic fibroblas	1.80e-82
14	989	54.6	155	1	R70812 FGF-1.	1.80e-82
15	989	54.6	155	1	P70482 Sequence encoded by co	1.80e-82
16	989	54.6	155	1	R80776 Fibroblast growth fact	1.80e-82
17	989	54.6	155	1	W53022 Fibroblast growth fact	1.80e-82
18	989	54.6	155	1	W75711 Fibroblast growth fact	1.80e-82
19	989	54.6	155	1	W75415 Human endothelial cell	1.80e-82
20	989	54.6	155	1	W92291 Human endothelial cell	1.80e-82
21	989	54.6	165	1	R05785 Human BECG encoded by	1.80e-82
22	989	54.6	168	1	W06818 Human endothelial cell	1.80e-82
23	983	54.2	134	1	W75413 Human alpha-endothelia	6.91e-82

24	983	54.2	134	1	W92282 Human alpha-endothelia	6.91e-82
25	983	54.2	134	1	W04807 Human alpha-endothelia	6.91e-82
26	978	53.9	156	1	W71383 Fibroblast growth fact	2.12e-81
27	972	53.6	135	1	W06817 Human endothelial cell	8.15e-81
28	960	53.0	132	1	R11327 9 N-terminal residue d	1.20e-79
29	960	53.0	132	1	R25418 aFGF mutain #2.	1.20e-79
30	958	52.8	155	1	R25570 Recombinant human Ala1	1.88e-79
31	958	52.8	155	1	W00561 Human (Gly93) aFGF ana	1.88e-79
32	953	52.6	140	1	R65935 Fibroblast growth fact	5.77e-79
33	938	51.7	129	1	R25419 aFGF mutain #3.	1.66e-77
34	938	51.7	129	1	R11328 12 N-terminal residue	1.66e-77
35	926	51.1	140	1	R65934 Bovine fibroblast grow	2.45e-76
36	926	51.1	140	1	R13030 Brain-derived acidic f	2.45e-76
37	926	51.1	140	1	R34496 Bovine acidic fibrobla	2.45e-76
38	926	51.1	140	1	P90069 Bovine acidic fibrobla	2.45e-76
39	926	51.1	140	1	R74648 Bovine recombinant aFG	2.45e-76
40	926	51.1	140	1	R25915 Human acidic fibroblas	2.45e-76
41	926	51.1	154	1	R05315 Human acidic fibroblas	2.45e-76
42	920	50.7	154	1	P90074 Recombinant human muta	9.37e-76
43	915	50.5	141	1	R25569 Recombinant bovine Ala	2.87e-75
44	915	50.5	141	1	W00560 Bovine (Ala47 Gly93) a	2.87e-75
45	902	49.8	155	1	W01746 Chimeric acid/basic fi	5.27e-74

ALIGNMENTS

RESULT 1  
ID R25914 standard; peptide; 140 AA.  
AC R25914;  
DT 26-JAN-1993 (first entry)  
DE Human acidic fibroblast growth factor.  
KW viral infections; viruses; FGF; herpes simplex virus; HSV-1; HSV-2;  
KW herpes varicella; herpes zoster; cytomegalovirus; influenza;  
KW human respiratory syncytial virus; Semliki Forest virus; HIV;  
KW human immunodeficiency virus; Moloney Sarcoma virus.  
PS Homo sapiens.  
PN EP-497341-A.  
PD 05-AUG-1992.  
PF 30-JAN-1992; 101541.  
PR 31-JAN-1991; GB-002145.  
PR 09-JAN-1992; GB-000410.  
PA (FARM ) FARMITALIA ERBA SRL CARLO.  
PI Battistini C, Carminati P, Garofano L, Mazue G, Ungheri D;  
DR WPI: 92-260792/32.  
PT Synergistic antiviral composition contains aFGF and sulphated  
PT polysaccharide - for treating viral infections e.g. HSV-1 and -2,  
PT cytomegalovirus, HIV, influenza virus etc.  
PS Disclosure; Page 4; 20pp; English.  
CC This sequence represents acidic fibroblast growth factor (aFGF).  
CC aFGF, or its fragments may be used in a synergistic compsn. with an  
CC antivirally active sulphated polysaccharide, and one or more  
CC excipients. The compsn. may be used to control herpes simplex virus  
CC (HSV-1 or -2) herpes varicella/zoster; cytomegalovirus; influenza;  
CC human respiratory syncytial virus; Semliki Forest virus; HIV or  
CC Moloney Sarcoma virus. The combination of aFGF with sulphated  
CC polysaccharide is found to have a greater antiviral activity than  
CC expected for an additive effect. See also R25913-5.  
SQ Sequence 140 AA;

Query Match 54.6%; Score 989; DB 1; Length 140;  
Best Local Similarity 98.5%; Pred. No. 1.80e-82;  
Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;  
Db 4 PGNVKKPKLLYCNSGHPFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTETQ 63  
QY 118 PVANYKKPKLLYCNSGHPFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTETQ 177  
Db 64 YLAMD7DGLLYGSGQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNCKRGPR 123  
QY 178 YLAMD7DGLLYGSGQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNCKRGPR 237  
Db 124 HYGQKAILFLPLPVSSD 140  
|||||





PN US552528-A.  
 PD 03-SEP-1996.  
 PF 03-MAR-1986; 835594.  
 PR 03-MAR-1986; US-835594.  
 PR 18-DEC-1987; US-134499.  
 PR 29-APR-1991; US-693079.  
 PR 27-NOV-1991; US-799859.  
 PR 03-NOV-1994; US-334884.  
 PA (RHON ) RHONE POULENC RORER PHARM INC.  
 PI Burgess W, Maciag T;  
 DR WPI: 96-412132/41.  
 DR N-PSDB; T37503.  
 PT Isolated, purified, biologically active bovine beta endothelial cell  
 PT growth factor - useful to regenerate or treat damaged blood vessels  
 PS Disclosure: Fig 8; 28pp; English.  
 CC Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having  
 CC a mol.wt. of 20 kD can be purified at least 16300 fold from bovine  
 CC brain using heparin-Sepharose affinity chromatography. ECGF is  
 CC useful for, among other purposes, diagnostic applications and has  
 CC potential in the treatment of damaged blood vessels or other  
 CC endothelial cell-lined structures.  
 CC Human ECGF (T37503) or fragments may be obtained using  
 CC oligonucleotides (T37504 and T37508 to T37509) whose design is based  
 CC on the sequence of bovine alpha- and beta-ECGF.  
 SQ Sequence 140 AA;

Query Match 54.6%; Score 989; DB 1; Length 140;  
 Best Local Similarity 98.5%; Pred. No. 1.80e-82;  
 Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Db 4 PPGNYKKPKLLYCSNGGHHFLRILPDGTGTRDRSDQHIQLQLSAESVGEVIKSTETGQ 63  
 QY 118 PVANYKKPKLLYCSNGGHHFLRILPDGTGTRDRSDQHIQLQLSAESVGEVIKSTETGQ 177  
 Db 64 YLAMDTGLLYGSQTPNEECFLERLEENHYNTYISKKHAENWVGLKKNKSGCKRGPR 123  
 QY 178 YLAMDTGLLYGSQTPNEECFLERLEENHYNTYISKKHAENWVGLKKNKSGCKRGPR 237  
 Db 124 HYGKAILFLPLPVSSD 140  
 QY 238 HYGKAILFLPLPVSSD 254

RESULT 6  
 ID P70995 standard; protein; 140 AA.  
 AC P70995;  
 DT 13-JUN-1991 (first entry)  
 DR Sequence of human proteinaceous factor (PFI) with mitogenic activity.  
 DR Cell growth promoter; mitogen; vascularisation; wound healing.  
 DR Homo sapiens.  
 DR misc\_difference 140  
 FT Key Location/Qualifiers  
 FT misc\_difference 140 /label= Asp-OH  
 PN EP-241136-A.  
 PD 14-OCT-1987.  
 PF 06-MAR-1987; 301969.  
 PR 07-MAR-1986; US-838096.  
 PA (HARD ) HARVARD COLLEGE.  
 PI Lobb RR, Harper JW, Strydom DJ;  
 DR WPI: 87-285995/41.  
 DR Mitogenic polypeptide isolated from human brain tissue - useful  
 PT for increasing vascular effect in eg wound healing, or  
 PT generating endothelial cell linings for vascular prostheses, etc.  
 PS Claim 3; Page 1; 31pp; English.  
 CC The PFI of the invention was obtd. from human brain tissue. It has a  
 CC mol. wt. of 15,200-16,500 (pref. 15,616-16,056) and has a high  
 CC affinity for heparin. PFI and fragments are useful for promoting the  
 CC growth of mesoderm-derived cells or neuroectoderm-derived cells and  
 CC generating endothelial cell linings for vascular prostheses (all  
 CC claimed). The polypeptides are useful for increasing vascularisation.  
 SQ Sequence 140 AA;

Query Match 54.6%; Score 989; DB 1; Length 140;  
 Best Local Similarity 98.5%; Pred. No. 1.80e-82;  
 Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Db 5 PPGNYKKPKLLYCSNGGHHFLRILPDGTGTRDRSDQHIQLQLSAESVGEVIKSTETGQ 64  
 QY 118 PVANYKKPKLLYCSNGGHHFLRILPDGTGTRDRSDQHIQLQLSAESVGEVIKSTETGQ 177  
 Db 65 YLAMDTGLLYGSQTPNEECFLERLEENHYNTYISKKHAENWVGLKKNKSGCKRGPR 124  
 QY 178 YLAMDTGLLYGSQTPNEECFLERLEENHYNTYISKKHAENWVGLKKNKSGCKRGPR 237  
 Db 125 HYGKAILFLPLPVSSD 141  
 QY 238 HYGKAILFLPLPVSSD 254

RESULT 8

Best Local Similarity 98.5%; Pred. No. 1.80e-82;  
 Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Db 4 PPGNYKKPKLLYCSNGGHHFLRILPDGTGTRDRSDQHIQLQLSAESVGEVIKSTETGQ 63  
 QY 118 PVANYKKPKLLYCSNGGHHFLRILPDGTGTRDRSDQHIQLQLSAESVGEVIKSTETGQ 177  
 Db 64 YLAMDTGLLYGSQTPNEECFLERLEENHYNTYISKKHAENWVGLKKNKSGCKRGPR 123  
 QY 178 YLAMDTGLLYGSQTPNEECFLERLEENHYNTYISKKHAENWVGLKKNKSGCKRGPR 237  
 Db 124 HYGKAILFLPLPVSSD 140  
 QY 238 HYGKAILFLPLPVSSD 254

RESULT 7  
 ID R10527 standard; Protein; 141 AA.  
 AC R10527;  
 DT 15-APR-1991 (first entry)  
 DE Human acidic fibroblast growth factor gene.  
 KW aFGF; antibody; antigen; cancer; ss.  
 OS Homo sapiens.  
 FH Key Location/Qualifiers  
 FT region 2..12  
 FT /label= A  
 FT region 56..67  
 FT /label= B  
 FT region 104..114  
 FT /label= C  
 FT region 132..141  
 FT /label= D  
 PN J02306996-A.  
 PD 20-DEC-1990.  
 PF 03-JUL-1989; 172542.  
 PR 04-JUL-1988; JP-166275.  
 PR 03-JUL-1989; JP-172542.  
 PA (TAKE ) TAKEDA CHEMICAL IND KK.  
 DR WPI: 91-040150/06.  
 DR N-PSDB; Q10399.  
 PT Anti-acid antibody, for cancer diagnosis, etc. - is obtd. by  
 PT using complex of partial peptide(s) of acid fibroblast growth  
 PT factor and protein as antigen.  
 PS Disclosure: Fig 1; 19pp; Japanese.  
 CC The was deduced from a gene used to produce recombinant aFGF.  
 CC Peptides derived from the protein, esp. from A-D can be used to as  
 CC antigens to produce anti-aFGF antibodies. The peptides must  
 CC comprise 8-10 continuous AAs from A or B (claims 5 and 6 resp.),  
 CC 7-10 continuous AAs from C (claim 7), or 8-9 continuous AAs from D  
 CC (claim 8). The Abs can be used for immunochemically measuring aFGF,  
 CC and for purifying aFGF. They are useful as reagents in the diag-  
 CC nosis of various cancers or diseases of the CNS. Purified aFGF  
 CC has wound healing and nerve cell proliferating properties.  
 SQ Sequence 141 AA;

Query Match 54.6%; Score 989; DB 1; Length 141;  
 Best Local Similarity 98.5%; Pred. No. 1.80e-82;  
 Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Db 5 PPGNYKKPKLLYCSNGGHHFLRILPDGTGTRDRSDQHIQLQLSAESVGEVIKSTETGQ 64  
 QY 118 PVANYKKPKLLYCSNGGHHFLRILPDGTGTRDRSDQHIQLQLSAESVGEVIKSTETGQ 177  
 Db 65 YLAMDTGLLYGSQTPNEECFLERLEENHYNTYISKKHAENWVGLKKNKSGCKRGPR 124  
 QY 178 YLAMDTGLLYGSQTPNEECFLERLEENHYNTYISKKHAENWVGLKKNKSGCKRGPR 237  
 Db 125 HYGKAILFLPLPVSSD 141  
 QY 238 HYGKAILFLPLPVSSD 254

ID R05789 standard; Protein; 151 AA.  
AC R05789;  
DE 22-AUG-1990 (first entry)  
DT Human aFGF encoded by synthetic gene.  
KW Acidic fibroblast growth factor; aFGF; thrombogenesis;  
KW atherosclerosis; tumors.  
OS Synthetic.  
FT Key Location/Qualifiers  
FT misc\_difference 146. 147  
FT /note= "sites corresp. to two stop codons of  
FT the DNA sequence"  
PN GB223496-A.  
PN 11-APR-1990.  
PF 08-AUG-1988; 018775.  
PR 08-AUG-1988; GB-018775.  
PA (BRBI-) Brit Bio-Tech Ltd.  
PI Davies JA, Johnson ID;  
DR WPI: 90-109882/15.  
DR N-PSDB; Q03873.  
DE Gene encoding human acidic fibroblast growth factor -  
DE incorporates useful restriction sites at frequent intervals to  
DE facilitate cassette mutagenesis of specified regions.  
PS Claim 2; Fig 3a; 12pp; English.  
CC The synthetic aFGF gene incorporates useful restriction sites at  
CC frequent intervals to facilitate the cassette mutagenesis of  
CC selected regions. Also included are flanking sites to simplify  
CC the incorporation of the gene into any expression system.  
CC The aFGF mol. acts in a cascade effect to control endothelial cell  
CC activity either co-ordinately through synergistic effects or via  
CC independent routes. The regulation of endothelial cells is essential  
CC for the protection of arteries, veins and capillaries from the effect  
CC of thrombogenesis. Their stimulation and control by these factors is  
CC also thought to be important in the development of tumours and  
CC atherosclerosis.  
SQ Sequence 151 AA;

Query Match 54.6%; Score 989; DB 1; Length 151;  
Best Local Similarity 98.5%; Pred. No. 1.80e-82;  
Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Db 9 PPGNYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQ 68  
QY 118 PVANYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQ 177  
| : |||||  
Db 69 YLAMTDGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPR 128  
QY 178 YLAMTDGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPR 237  
| : |||||  
QY 129 HYGOKAILFLPLPVSSD 145  
QY 238 HYGOKAILFLPLPVSSD 254

RESULT 9  
ID W92283 standard; protein; 154 AA.  
AC W92283;  
DE 20-APR-1999 (first entry)  
DT Human beta-endothelial cell growth factor (ECGF) protein sequence.  
KW Endothelial cell growth factor; ECGF; cleavable; recombinant; repair;  
KW regenerate; blood vessel; endothelial cell; human.  
OS Homo sapiens.  
PN US5849538-A.  
PD 15-DEC-1998.  
PR 11-APR-1997; 840088.  
PR 04-NOV-1996; US-743261.  
PR 03-MAR-1986; US-835594.  
PR 18-DEC-1987; US-134499.  
PR 29-APR-1991; US-693079.  
PR 27-NOV-1991; US-799859.  
PR 03-NOV-1994; US-334884.  
PR 11-APR-1997; US-840088.  
PA (RHON ) RHONE-POULENC RORER PHARM INC.

Query Match 54.6%; Score 989; DB 1; Length 154;  
Best Local Similarity 98.5%; Pred. No. 1.80e-82;  
Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Db 18 PPGNYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQ 77  
QY 118 PVANYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQ 177  
| : |||||  
Db 78 YLAMTDGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPR 137  
QY 178 YLAMTDGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPR 237  
| : |||||  
Db 138 HYGOKAILFLPLPVSSD 154  
QY 238 HYGOKAILFLPLPVSSD 254

RESULT 10  
ID W04805 standard; Protein; 154 AA.  
AC W04805;  
DE 29-DEC-1996 (first entry)  
DT Human beta-endothelial cell growth factor.  
KW Endothelial cell growth factor; ECGF; blood vessel; regeneration;  
KW heparin-Sepharose affinity chromatography; probe; oligonucleotide;  
KW FGF; fibroblast growth factor.  
OS Homo sapiens.  
PN US552528-A.  
PD 03-SEP-1996.  
PF 03-MAR-1986; 835594.  
PR 03-MAR-1986; US-835594.  
PR 18-DEC-1987; US-134499.  
PR 29-APR-1991; US-693079.  
PR 27-NOV-1991; US-799859.  
PR 03-NOV-1994; US-334884.  
PA (RHON ) RHONE-POULENC RORER PHARM INC.  
PI Burgess W, Maciag T;  
DR WPI: 96-412132/41.  
DR N-PSDB; T37503.  
DE Isolated, purified, biologically active bovine beta endothelial cell  
DE growth factor - useful to regenerate or treat damaged blood vessels  
DE Disclosure; Fig 8; 28pp; English.  
PS Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having  
PS a mol.wt. of 20 kD can be purified at least 16300 fold from bovine  
PS brain using heparin-Sepharose affinity chromatography. ECGF is  
PS useful for, among other purposes, diagnostic applications and has  
PS potential in the treatment of damaged blood vessels or other  
PS endothelial cell-lined structures.  
CC Human ECGF (T37503) or fragments may be obtained using  
CC oligonucleotides (T37504 and T37508 to T37509) whose design is based  
CC on the sequence of bovine alpha- and beta-ECGF.  
SQ Sequence 154 AA;

Query Match 54.6%; Score 989; DB 1; Length 154;  
Best Local Similarity 98.5%; Pred. No. 1.80e-82;  
Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Db 18 PPGNYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQ 77  
QY 118 PVANYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQ 177  
| : |||||

PF	04-NOV-1996; 743261.
PR	04-NOV-1996; US-743261.
PR	03-MAR-1986; US-835594.
PR	18-DEC-1987; US-134499.
PR	29-APR-1991; US-593079.
PR	27-NOV-1991; US-799859.
PR	03-NOV-1994; US-334884.
PR	07-JUN-1995; US-472964.
PI	(RHON ) RHONE-POULENC RORER PHARM INC.
PA	Burgess W, Drohan WN, Jaye M, Maciag T;
WPI	98-594032/50.
PT	Compositions for promoting wound healing - containing endothelial
PT	cell growth factor polypeptides
PS	Claim 1; Column 16; 23pp; English.
CC	This sequence represents the amino acid sequence of the mature human
CC	beta-endothelial cell growth factor (b-ECGF). This amino acid sequence
CC	is identical to the alpha-ECGF but the beta sequence contains an extra
CC	20 N-terminal amino acids. The sequence was isolated from a human brain
CC	stem cell cDNA library using a probe designed based on fragments of the
CC	bovine ECGF (see W75416-W75418). The ECGF protein can be used in
CC	compositions for promoting wound healing. ECGF is also used to grow
CC	cells on a prosthetic device.
SQ	Sequence 154 AA;
Query Match            54.6%; Score 989; DB 1; Length 154;	
Best Local Similarity 98.5%; Pred.No.1.80e-82;	
Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;	
Db	18 PPGNYKKPKLLYCSNGGHFLRLPDGTVDGTDRDSQHILQLLSAESYGEVIKSTETGQ 77
QY	: ::::::::::::::::::::  118 PVANYKKPKLLYCSNGGHFLRLPDGTVDGTDRDSQHILQLLSAESYGEVIKSTETGQ 177
Db	78 YLAMTDGLLYGSOTPNECLFLEREENHYNTYSKKHAENWFVLKKNCKRGPRPT 137
QY	: ::::::::::::::::::::  178 YLAMTDGLLYGSOTPNECLFLEREENHYNTYSKKHAENWFVLKKNCKRGPRPT 237
Db	138 HYGQKAILFLPLPVSSD 154
QY	: ::::::::::::::::::::  238 HYGQKAILFLPLPVSSD 254
RESULT 13	
ID	P94037 standard; protein; 155 AA.
AC	P94037;
DT	25-JUN-1990 (first entry)
DE	Human acidic fibroblast growth factor.
DE	Acidic fibroblast growth factor.
KW	Homo sapiens.
OS	O homo sapiens.
PN	EP-298723-A.
PD	11-JAN-1989.
PF	06-JUL-1988; 306158.
PR	07-JUL-1987; US-070797.
PA	(BIOT-) Biotechn Res Assoc.
FI	Fiddes JC, Abraham JA, Protter A;
DR	WPI; 89-009785/02.
DR	N-PSDB: N93088.
PT	Recombinant DNA encoding new fibroblast growth factor
PT	analogues - useful eg for accelerating wound healing and
PT	to control neovascularisation.
PS	Disclosure; p; English.
CC	See also P94036.
SQ	Sequence 155 AA;
Query Match            54.6%; Score 989; DB 1; Length 155;	
Best Local Similarity 98.5%; Pred.No.1.80e-82;	
Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;	
Db	19 PPGNYKKPKLLYCSNGGHFLRLPDGTVDGTDRDSQHILQLLSAESYGEVIKSTETGQ 78
QY	: ::::::::::::::::::::  118 PVANYKKPKLLYCSNGGHFLRLPDGTVDGTDRDSQHILQLLSAESYGEVIKSTETGQ 177
Db	79 YLAMTDGLLYGSOTPNECLFLEREENHYNTYSKKHAENWFVLKKNCKRGPRPT 138
QY	: ::::::::::::::::::::  178 YLAMTDGLLYGSOTPNECLFLEREENHYNTYSKKHAENWFVLKKNCKRGPRPT 237

QY	178	YLAMDIDGLLYGSQTPNEECFLERLEENHYNTYISKKAHXKWNFVGLKKNKSGCRGPT	237
Db	139	HYGQKAILFLPLPVSSD	155
QY	238	HYGQKAILFLPLPVSSD	254

RESULT	14
ID	R70812 standard; protein; 155 AA.
AC	R70812;
DE	01-SEP-1995 (first entry)
DE	FGF-1.
KW	FGF-1; fibroblast growth factor; cytotoxic conjugate; fusion protein;
KW	saporin; cytostatic; tumor; diabetes; rheumatoid arthritis.
OS	Homo sapiens.
FT	Key location/Qualifiers
FT	misc_difference 31
FT	/note- "Cys may be replaced by Ser"
FT	misc_difference 132

WO9503831-A, 09-FEB-1995, 27-JUL-1994; U08511, 02-AUG-1993; US-099924, 29-OCT-1993; US-145829, (PRIZM PHARM INC., (WHIT-) WHITTIER INST DIABETES & ENDOCRINOLOGY, Baird AJ, Lappi DA, Sosnowski BA; WPI; 95-082038/11.

PT New monogenic preparations of cytotoxic conjugates and DNA -  
PT contain fibroblast growth factors and cytotoxic agents for  
PT treating FGF conditions such as tumours, diabetes and rheumatoid  
PT arthritis.  
PT Disclosure; Page 108-109; 128pp; English.

PS Novel fusion proteins comprise FGF linked to saporin. FGF-1 to -9  
CC may be used, pref. FGF-1 (R70812), FGF-5 (R70813), FGF-7 (R70814) or  
CC FGF-8 (R70815) muteins, in which at least 1 Cys residue is replaced  
CC by conservative-Ser-substitutions. The fusion proteins are potent  
CC cytotoxic agents to cells bearing the FGF receptor.  
CC Sequence 155 AA.

SO

Query Match	54.6%	Score 989;	DB 1;	Length 155;
Best Local Similarity	98.9%;	Pred. No. 1.80e-82;		
Matches 135;	Conservative 1;	Mismatches 1;	Indels 0;	Gaps
Db	19	PPGNYKKPKLLYCSNGGHFLRIIPDGTGTRDRSDQHQLQLSAESVGEVIYKSTETGQ	78	
QY	118	PVANYKKPKLLYCSNGGHFLRIIPDGTGTRDRSDQHQLQLSAESVGEVIYKSTETGQ	177	
QY	79	YLAMDTGLLYGSQTPNEECLFLERLEENHYNTYISKHAEKNWFVGLKKNGSKCRGPRT	138	
QY	178	YLAMDTGLLYGSQTPNEECLFLERLEENHYNTYISKHAEKNWFVGLKKNGSKCRGPRT	237	
Db	139	HYCQKAILFLPLPVSSD	155	
QY	238	HYCQKAILFLPLPVSSD	254	

RESULT	ID	Accession	Location/Qualifiers
15	F70482	standard; Protein; 155 AA.	
	AC	P70482;	
DE	13-MAY-1991	(first entry)	
DE	Sequence encoded by complete cDNA sequence of human endothelial		
DE	cell growth factor (ECGF).		
KW	Endothelial cell regeneration; blood vessel regeneration.		
OS	Homo sapiens.		
FH	Key		
FT	protein		
FT	2..15		
FT	/label= Beta ECGF		
FT	16..21		
FT	/label= Acidic FGF		
FT	22..155		
FT	/label= Alpha ECGF		
FT			

PN	W08705332-A.
PD	11-SEP-1987.
PF	02-MAR-1987; U00425.
PR	03-MAR-1986; US-835594.
PR	26-MAR-1987; ES-000812.
PA	(MELO-) MELOY LAB INC.
PA	(RORE-) RORER BIOTECHN INC.
PA	(RORE-) RORER.
PA	BIOTECH INC.
PI	Jaye M, Burgess W, Maciag T, Drohan W;
DR	WPI; 87-264128/37.
DR	N-PSDB; N70788
PT	Human endothelial cell growth factor - produced by recombinant
PT	DNA techniques, useful for wound healing
PS	Example; Fig 8; 43pp; English.
CC	To screen the human brain stem cDNA library for clones contg. ECGF
CC	inserts, a specific oligonucleotide was designed. This
CC	oligonucleotide was based upon a partial AA sequence analysis of
CC	the amino terminus of ECGF (see P70480 and P70481). Fig 3c sets
CC	forth for comparison the AA sequence of cyanogen bromide-cleaved
CC	bovine alpha and beta ECGF (P70834). The two clones that were
CC	isolated, ECGF clones 1 and 29, were analysed in further detail. The
CC	nucleotide sequence of these clones and the AA sequence deduced from
CC	the nucleic acid sequence is shown in Fig 8 (see N70788 and P70482).
SQ	Sequence 155 AA;

Search completed: Tue Aug 29 16:00:40 2000  
Job time : 33 secs.

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W A R E  
(TM)  
\*\*\*\*\*

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MPSrch\_pp protein - protein database search, using Smith-Waterman algorithm  
on: Tue Aug 29 15:58:50 2000; MasPar time 14.61 Seconds  
820.223 Million cell updates/sec  
Abular output not generated.

Title: >US-09-121-017B-21  
Description: (1-254)-from US09121017B.ppt  
Perfect Score: 1813  
Sequence: 1 MAPARLALLLEFFVGVAES.....PRHYGQRAILFLPLPVSSD 254

Scoring table: PAM 150  
Gap 11

Searched: 142080 seqs, 47172406 residues

Post-processing: Minimum Match 0%  
Listing first 45 summaries

Database: pir64  
1:pir1 2:pir2 3:pir3 4:pir4

Statistics: Mean 45.966; Variance 85.767; scale 0.536

Pred. NO. is the number of results predicted by chance to have a  
score greater than or equal to the score of the result being printed,  
and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description	Pred. No.
1	989	54.6	155	1	A33665 acidic fibroblast gro	1.20e-184
2	976	53.8	155	2	D37360 acidic fibroblast gro	9.29e-182
3	976	53.8	155	2	S04147 acidic fibroblast gro	9.29e-182
4	973	53.7	155	1	A60721 acidic fibroblast gro	4.31e-178
5	958	52.8	152	2	JR0476 acidic fibroblast gro	9.26e-178
6	926	51.1	155	1	GRBOA acidic fibroblast gro	1.17e-170
7	926	51.1	155	2	A60130 acidic fibroblast gro	1.17e-170
8	915	50.5	155	2	JW0055 fibroblast growth fac	3.20e-168
9	827	45.6	198	2	JC1457 ryudocan precursor -	8.96e-149
10	546	30.1	202	2	A24210 ryudocan precursor -	1.28e-87
11	527	29.1	189	2	A48834 basic fibroblast grow	1.47e-83
12	521	28.7	146	1	S00185 basic fibroblast grow	2.80e-82
13	521	28.7	157	1	GRBOB basic fibroblast grow	2.80e-82
14	514	28.4	210	2	A32398 basic fibroblast grow	8.68e-81
15	513	28.3	154	2	C37360 basic fibroblast grow	1.42e-80
16	513	28.3	154	2	A31674 basic fibroblast grow	1.42e-80
17	505	27.9	198	2	JC5613 ryudocan precursor -	7.13e-79
18	503	27.7	164	2	S31622 basic fibroblast grow	1.90e-78
19	494	27.2	155	1	A40117 basic fibroblast grow	1.54e-76
20	471	26.0	137	2	I46711 fibroblast growth fac	1.13e-71
21	350	19.3	208	2	A48137 fibroblast growth fac	1.53e-46
22	350	19.3	208	2	S66486 fibroblast growth fac	1.53e-46
23	329	18.1	207	2	JC5941 fibroblast growth fac	2.77e-42

ALIGNMENTS

RESULT ENTRY	1	207	2	JC5940	fibroblast growth fac	2.82e-41
ALTERNATE_NAMES	A33665	17.9	194	2	keratinocyte growth f	7.14e-37
ORGANISM	acidic fibroblast growth factor 1 precursor - human	16.7	194	1	keratinocyte growth fac	2.82e-36
DATE	beta-ECGF; endothelial cell growth factor beta;	26	299	1	keratinocyte growth f	1.75e-35
ACCESSIONS	heparin-binding growth factor 1	27	295	2	keratinocyte growth fac	4.37e-35
REFERENCE	#formal_name Homo sapiens #common_name man	28	293	2	embryonic fibroblast	4.25e-34
#authors	10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change	29	288	2	embryonic fibroblast	1.53e-31
#journal	A33665; A32316; S18217; A43804; A24662; JH0707; S35535;	30	275	2	fibroblast growth fac	9.74e-32
#title	S35536; I39413; A23553; A24820; A24243; A24301; A26386;	31	276	2	transforming protein	2.40e-31
#cross-references	A53639	32	274	2	fibroblast growth fac	2.40e-31
#molecule_type	A33665	33	274	2	fibroblast growth fac	1.45e-30
#residues	Mergia, A.; Tischer, E.; Graves, D.; Tumolo, A.; Miller, J.;	34	270	2	transforming protein	2.27e-30
#cross-references	Gospodarowicz, D.; Abraham, J.A.; Shipley, G.D.; Fiddes,	35	269	1	fibroblast growth fac	8.72e-30
#authors	J.C.	36	266	2	HST protein - bovine	3.33e-29
#journal	Biochem. Biophys. Res. Commun. (1989) 164:1121-1129	37	263	2	fibroblast growth fac	4.84e-28
#title	Structural analysis of the gene for human acidic fibroblast	38	257	2	fibroblast growth fac	1.18e-27
#cross-references	MUID:90073637	39	255	1	fibroblast growth fac	2.61e-26
#accession	A33665	40	248	2	FGF-3 - chicken	1.52e-25
#molecule_type	DNA	41	244	2	basic fibroblast grow	5.08e-24
#residues	1-155 #label MER	42	236	2	fibroblast growth fac	7.86e-24
#cross-references	GB:M30491	43	235	2	transforming protein	5.08e-24
#authors	Wang, W.P.; Lehtoma, K.; Varban, M.L.; Krishnan, I.; Chiu,	44	236	1	keratinocyte growth f	1.21e-23
#journal	Mol. Cell. Biol. (1989) 9:2387-2395	45	234	2		
#title	Cloning of the gene coding for human class 1 heparin-binding					
#cross-references	MUID:89343957					
#accession	A32316					
#molecule_type	DNA					
#residues	1-155 #label WAN					
#cross-references	GB:M23087; NID:gi83875; PIDN:AAA52638.1; PID:g386768					
#authors	Wang, W.P.; Quick, D.; Balcerzak, S.P.; Needleman, S.W.;					
#journal	Chiu, I.M.					
#title	Oncogene (1991) 6:1521-1529					
#cross-references	MUID:92019819					
#accession	S18217					
#molecule_type	DNA					
#residues	1-155 #label WA2					
#cross-references	EMBL:M23086					
#authors	A43804					

```

#authors      Chiu, I.M.; Wang, W.P.; Lehtoma, K.
#journal      Oncogene (1990) 5:755-762
#title        Alternative splicing generates two forms of mRNA coding for
              human heparin-binding growth factor 1.
#cross-references MUID:90265618
#accession    A43804
#molecule_type mRNA
#residues     1-155 ##label CHI
#cross-references EMBL:X51943; NID:g32435; PIDN:CAA36206.1; PID:g32436
REFERENCE
#authors      Jaye, M.; Howk, R.; Burgess, W.; Ricca, G.A.; Chiu, I.M.;
              Ravera, M.W.; O'Brien, S.J.; Modi, W.S.; Maciag, T.;
              Drohan, W.N.
#journal      Science (1986) 233:541-545
#title        Human endothelial cell growth factor: cloning, nucleotide
              sequence, and chromosome localization.
#cross-references MUID:86261805
#accession    A24662
#molecule_type mRNA
#residues     1-155 ##label JAY
#cross-references GB:M13361; NID:g181941; PIDN:AAA79245.1; PID:g181942
REFERENCE
#authors      Yu, Y.L.; Kha, H.; Golden, J.A.; Migchielsen, A.A.J.; Goetzl,
              E.J.; Turck, C.W.
#journal      J. Exp. Med. (1992) 175:1073-1080
#title        An acidic fibroblast growth factor protein generated by
              alternate splicing acts like an antagonist.
#cross-references MUID:92202857
#accession    JH0707
#molecule_type mRNA
#residues     1-155 ##label YUY
#cross-references GB:X65778; NID:g396163; PIDN:CAA46661.1; PID:g396164
REFERENCE
#authors      Payson, R.A.; Canatan, H.; Chotani, M.A.; Wang, W.P.; Harris,
              S.E.; Myers, R.L.; Chiu, I.M.
#journal      Nucleic Acids Res. (1993) 21:489-495
#title        Cloning of two novel forms of human acidic fibroblast growth
              factor (arGF) mRNA.
#cross-references MUID:93181239
#accession    S35535
#status       translation not shown
#molecule_type mRNA
#residues     1-58 ##label PAY
#cross-references GB:L01485
#accession    S35536
#status       translation not shown
#molecule_type mRNA
#residues     1-58 ##label PA2
#cross-references GB:L01487
REFERENCE
#authors      Crumley, G.; Dionne, C.A.; Jaye, M.
#journal      Biochem. Biophys. Res. Commun. (1990) 171:7-13
#title        The gene for human acidic fibroblast growth factor encodes
              two upstream exons alternatively spliced to the first
              coding exon.
#cross-references MUID:90365758
#accession    I39413
#status       translation not shown
#molecule_type mRNA
#residues     1-40 ##label RES
#cross-references GB:M60515; NID:g178226; PIDN:AAA51672.1; PID:g553170;
              GB:M60516; NID:g178232; PID:g553171
REFERENCE
#authors      Harper, J.W.; Strydom, D.J.; Lobb, R.R.
#journal      Biochemistry (1986) 25:4097-4103
#cross-references MUID:86296647
#accession    A23553
#molecule_type protein
#residues     16-155 ##label HAR
REFERENCE
#authors      Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal      Biochem. Biophys. Res. Commun. (1986) 138:611-617
#title        The complete amino acid sequence of human brain-derived

```

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acidic fibroblast growth factor.
#cross-references MUID:86295741
#accession    A24820
#molecule_type protein
#residues     16-155 ##label GIM
REFERENCE
#authors      Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal      Biochem. Biophys. Res. Commun. (1986) 135:541-548
#title        Human brain-derived acidic and basic fibroblast growth
              factors: amino terminal sequences and specific mitogenic
              activities.
#cross-references MUID:86186784
#accession    A24243
#molecule_type protein
#residues     16-47 ##label GI2
#experimental_source brain
REFERENCE
#authors      Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
#journal      FEBS Lett. (1986) 204:203-207
#title        Partial molecular characterization of endothelial cell
              mitogens from human brain: acidic and basic fibroblast
              growth factors.
#cross-references MUID:86275260
#accession    A24301
#molecule_type protein
#residues     16-30,'X',32-49 ##label GAU
REFERENCE
#authors      Gautschi-Sova, P.; Muller, T.; Bohlen, P.
#journal      Biochem. Biophys. Res. Commun. (1986) 140:874-880
#title        Amino acid sequence of human acidic fibroblast growth factor.
#cross-references MUID:87048871
#accession    A26386
#molecule_type protein
#residues     18-155 ##label GA2
#experimental_source brain
REFERENCE
#authors      Chavan, A.J.; Haley, B.E.; Volkin, D.B.; Marfia, K.E.;
              Verticelli, A.M.; Bruner, M.W.; Draper, J.P.; Burke, C.J.;
              Middaugh, C.R.
#journal      Biochemistry (1994) 33:7193-7202
#title        Interaction of nucleotides with acidic fibroblast growth
              factor (FGF-1).
#cross-references MUID:94271773
#accession    A53639
#molecule_type protein
#residues     16-30,'X',32-38;73-75,'X',77-97,'X',99-101;128-131,'X',
              133-140,'X',142-152 ##label CHA
GENETICS
#gene         GDB:FGF1; FGFA
#cross-references GDB:119909; OMIM:131220
#map_position 5q31.3-5q33.2
#introns      57/1; 91/3
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS        alternative splicing; growth factor; heparin binding
FEATURE
16-155         #product fibroblast growth factor 1 #status experimental
              #label HAR
129            #binding_site carbohydrate-(Asn)_(covalent).#status
              absent
SUMMARY
Query Match      54.6%; Score 989; DB 1; Length 155;
Best Local Similarity 98.5%; Pred No. 1,20e-184;
Matches 135; Conservative 1; Mismatches 1; Indels 0; Gaps 0;
Db 19 PPGYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEYVVKSTETGQ 78
Qy 118 PVANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHIQLQLSAESVGEYVVKSTETGQ 177
Db 79 YLAMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNGSKRGPR 138
Qy 178 YLAMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNGSKRGPR 237

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Db 139 HYGQKAILFLPLPVSSD 155
      |||
QY 238 HYGQKAILFLPLPVSSD 254

RESULT 2
ENTRY title The nucleotide sequence of rat heparin binding growth factor
      1 (HBGF-1).
ALTERNATE_NAMES #cross-references EMBL:89240051
ORGANISM #molecule_type mRNA
          #residues 1-155 #label GOO
          #cross-references EMBL:114232; NID:g56351; PIDN:CAA32448.1; PID:g56352
          #superfamily fibroblast growth factor
          #growth factor; heparin binding
          #length 155 #molecular-weight 17417 #checksum 9341
DATE 17-Apr-1993 #sequence_revision 17-Apr-1993 #text_change
      16-Jul-1999

ACCESSIONS D37360 #type complete
REFERENCE #acidic fibroblast growth factor - mouse
#authors aFGF; FGF-1
#journal #formal_name Mus musculus #common_name house mouse
#title 17-Apr-1993 #sequence_revision 17-Apr-1993 #text_change
      16-Jul-1999
      D37360; JC5231
      Hebert, J.M.; Basilico, C.; Goldfarb, M.; Haub, O.; Martin,
      G.R.
      Dev. Biol. (1990) 138:454-463
      Isolation of cDNAs encoding four mouse FGF family members and
      characterization of their expression patterns during
      embryogenesis.
#cross-references MUID:90201563
#accession D37360
#status preliminary
#molecule_type mRNA
#residues 1-155 #label HEB
#cross-references GB:M30641; NID:g193284; PIDN:AAA37618.1; PID:g309236
      JC5231
#authors Madial, F.; Hackshaw, K.V.; Chiu, I.M.
#journal Gene (1996) 179:231-236
#title Cloning and Characterization of the mouse Fgf-1 gene.
#cross-references MUID:97128312
#accession JC5231
#status preliminary
#molecule_type DNA
#residues 1-155 #label MAD
#cross-references GB:U36456
COMMENT This protein is an inducer of neovascularization in angiogenic
      disease including atherosclerosis, cancer and inflammatory
      autoimmune disease.

GENETICS
#gene Fgf-1
#introns 57/1; 91/3
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341

Query Match 53.8%; Score 976; DB 2; Length 155;
Best Local Similarity 91.7%; Pred. No. 9.29e-182;
Matches 132; Conservative 7; Mismatches 4; Indels 1; Gaps 1;

12 LTERNLPLGNKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVYI 71
   : 1:: :|||
QY 112 IPKRIS-PVANKPKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVYI 170
   :|||

Db 72 KGTETGOYLANDTEGLLYGSQTPNEECFLERLEENHYNTYTSKKHAENKFWVGLKNGS 131
   :|||
QY 171 KSTETGOYLANDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAENKFWVGLKNGS 230
   :|||

Db 132 CKRGRPTHYGOKAILFLPLPVSSD 155
      |||
QY 231 CKRGRPTHYGOKAILFLPLPVSSD 254
      |||

RESULT 4
ENTRY title acidic fibroblast growth factor - golden hamster
      A60721
ALTERNATE_NAMES #type complete
ORGANISM #heparin-binding growth factor 1
          #formal_name Mesocricetus auratus #common_name golden hamster
          #length 155 #molecular-weight 17403 #checksum 9573
          10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change
          10-Sep-1999
          A60721
ACCESSIONS A60721
REFERENCE Hall, J.A.; Harris, M.A.; Malark, M.; Mansson, P.E.; Zhou,
#authors H.; Harris, S.E.
#journal J. Cell. Biochem. (1990) 43:17-26
#title Characterization of the hamster DDT-1 cell aFGF/HBGF-I gene
          and cDNA and its modulation by steroids.
#cross-references MUID:90270291
#accession A60721
#status not compared with conceptual translation
#molecule_type DNA
#residues 1-155 #label HAL
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS #growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17403 #checksum 9573

Query Match 53.7%; Score 973; DB 1; Length 155;
Best Local Similarity 92.4%; Pred. No. 4.31e-181;
Matches 133; Conservative 5; Mismatches 5; Indels 1; Gaps 1;

12 LTERNLPLGNKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVYI 71
   : 1:: :|||
QY 112 IPKRIS-PVANKPKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESAGEVYI 170
   :|||

Db 72 KGTETGOYLANDTEGLLYGSQTPNEECFLERLEENHYNTYTSKKHAENKFWVGLKNGS 131
   :|||
QY 171 KSTETGOYLANDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAENKFWVGLKNGS 230
   :|||

Db 132 CKRGRPTHYGOKAILFLPLPVSSD 155
      |||
QY 231 CKRGRPTHYGOKAILFLPLPVSSD 254
      |||

RESULT 5
ENTRY title acidic fibroblast growth factor - pig (fragment)
      JH0476
ALTERNATE_NAMES #type fragment
ORGANISM #acidic fibroblast growth factor - pig (fragment)
          #formal_name Sus scrofa domestica #common_name domestic pig
          #length 155 #molecular-weight 17403 #checksum 9573
          31-Mar-1992 #sequence_revision 31-Mar-1992 #text_change
          31-Mar-1992
          JH0476
ACCESSIONS JH0476
REFERENCE Goodrich, S.P.; Yan, G.C.; Bahrenburg, K.; Mansson, P.E.
#authors Nucleic Acids Res. (1989) 17:2867
#journal
```

16-Jul-1999  
ACCESSIONS JH0476; S20072  
REFERENCE JH0476  
#authors Schmidt, M.; Sharma, H.S.; Schott, R.J.; Schaper, W.  
#journal Biochem. Biophys. Res. Commun. (1991) 180:853-859  
#title Amplification and sequencing of mRNA encoding acidic fibroblast growth factor (aFGF) from porcine heart.  
#cross-references MUID:92062117  
#accession JH0476  
##molecule\_type mRNA  
##residues 1-152 #label SCH  
##cross-references EMBL:X60311; NID:g1873; PIDN:CAA42869.1; PID:g1874  
##experimental\_source heart  
##note the hydrophobic core residues are packed around the internal symmetry axis

COMMENT This protein belongs to the fibroblast growth factor family.  
CLASSIFICATION superfamily fibroblast growth factor  
KEYWORDS growth factor; heparin binding  
FEATURE  
22-28 #region nuclear location signal  
133 #binding\_site heparin (Lys) #status predicted  
SUMMARY #length 152 #checksum 1124

Query Match 52.8%; Score 958; DB 2; Length 152;  
Best Local Similarity 96.3%; Pred. No. 9.26e-178;  
Matches 129; Conservative 2; Mismatches 3; Indels 0; Gaps 0;

Db 19 PPGNYKPKLLYCSNGHFLRIIPDGTGTRDRSDHQHQLQLSAESVGEVYIKSTETGQ 78  
| :|||||  
QY 118 PVANYKPKLLYCSNGHFLRIIPDGTGTRDRSDHQHQLQLSAESVGEVYIKSTETGQ 177  
| :|||||  
Db 79 YLAMDTGSLYGSQTSEECFLERLEENHYNTYTSKHAENWVGLKNGSKRGPR 138  
| :|||||  
QY 178 YLAMDTGSLYGSQTSEECFLERLEENHYNTYTSKHAENWVGLKNGSKRGPR 237  
| :|||||  
Db 139 HYGOKAILFLPLPV 152  
| :|||||  
QY 238 HYGOKAILFLPLPV 251  
| :|||||

RESULT 6  
ENTRY GKBOA #type complete  
TITLE acidic fibroblast growth factor precursor - bovine  
ALTERNATE\_NAMES aFGF; eye-derived growth factor II; heparin-binding growth factor I; prostatin  
ORGANISM #formal\_name Bos primigenius taurus #common\_name cattle  
DATE 13-Aug-1986 #sequence\_revision 03-Feb-1994 #text\_change 18-Jun-1999

ACCESSIONS JH0613; S02102; S20661; B24663; A94281; S03953;  
A91010; A24477; B25043; C25043; A24539; A60884;  
A37892; B37892; A61198; I46024; A34477; A01385  
JH0613

REFERENCE Renaud, F.; Desset, S.; Bugra, K.; Halley, C.; Philippe, J.M.; Courtois, Y.; Laurent, M.  
#journal Biochem. Biophys. Res. Commun. (1992) 184:945-952  
#title Heterogeneity of 3' untranslated region of bovine acidic FGF transcripts.  
#cross-references MUID:92246990  
#accession JH0613  
##molecule\_type DNA  
##residues 58-155 #label REN

REFERENCE S02102  
#authors Halley, C.; Courtois, Y.; Laurent, M.  
#journal Nucleic Acids Res. (1988) 16:10913  
#title Nucleotide sequence of bovine acidic fibroblast growth factor cDNA.  
#cross-references MUID:89083506  
#accession S02102  
##molecule\_type mRNA  
##residues 1-155 #label HAL  
##cross-references EMBL:X13221; NID:g347; PIDN:CAA31610.1; PID:g348  
S02661  
#authors Alterio, J.; Halley, C.; Brqu, C.; Soussi, T.; Courtois, Y.;

Laurent, M.  
FEBS Lett. (1988) 242:41-46  
Characterization of a bovine acidic FGF cDNA clone and its expression in brain and retina.  
#cross-references MUID:89078619  
#accession S02661  
##molecule\_type mRNA  
##residues 1-155 #label ALT  
##cross-references EMBL:X14032; NID:g322; PIDN:CAA32192.1; PID:g323  
S22065  
REFERENCE Philippe, J.M.  
#authors submitted to the EMBL Data Library, May 1992  
#accession S22065  
##molecule\_type mRNA  
##residues 1-18 #label PHI  
##cross-references EMBL:X56446; NID:g411; PIDN:CAA47063.1; PID:g412  
A94290  
REFERENCE Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman, J.; Hjertild, K.A.; Gospodarowicz, D.; Fiddes, J.C.  
#journal Science (1986) 233:545-548  
#title Nucleotide sequence of a bovine clone encoding the angiogenic protein, basic fibroblast growth factor.  
#cross-references MUID:86261806  
#accession B24663  
##molecule\_type mRNA  
##residues 62-102 #label ABR  
REFERENCE A94281  
#authors Gimenez-Gallego, G.; Rodkey, J.; Bennett, C.; Rios-Candelore, M.; Dalsalvo, J.; Thomas, K.  
#journal Science (1985) 230:1385-1388  
#title Brain-derived acidic fibroblast growth factor: complete amino acid sequence and homologies.  
#cross-references MUID:86070224  
#accession A94281  
##molecule\_type protein  
##residues 16-155 #label GIM  
REFERENCE S03953  
#authors Quinkler, W.; Maasberg, M.; Bernotat-Danielowski, S.; Luethe, N.; Sharma, H.S.; Schaper, W.  
#journal Eur. J. Biochem. (1989) 181:67-73  
#title Isolation of heparin-binding growth factors from bovine, porcine and canine hearts.  
#cross-references MUID:89231704  
#accession S03953  
##molecule\_type protein  
##residues 16-45 #label QUI  
REFERENCE A91010  
#authors Bohlen, P.; Esch, F.; Baird, A.; Gospodarowicz, D.  
#journal EMBO J. (1985) 4:1951-1956  
#title Acidic fibroblast growth factor (FGF) from bovine brain: amino-terminal sequence and comparison with basic FGF.  
#cross-references MUID:86055750  
#accession A91010  
##molecule\_type protein  
##residues 16-30, 'X', 32-34, 'X', 36-44 #label BOH  
REFERENCE A24477  
#authors Crabb, J.W.; Ames, L.G.; Carr, S.A.; Johnson, C.M.; Roberts, G.D.; Bordoli, R.S.; McKeenan, W.L.  
#journal Biochemistry (1986) 25:4988-4993  
#title Complete primary structure of prostatin, a prostate epithelial cell growth factor.  
#cross-references MUID:87026586  
#accession A24477  
##molecule\_type protein  
##residues 2, 'GE', 5-155 #label CRA  
REFERENCE A94127  
#authors Burgess, W.H.; Mehman, T.; Marshak, D.R.; Fraser, B.A.; Maciag, T.  
#journal Proc. Natl. Acad. Sci. U.S.A. (1986) 83:7216-7220  
#title Structural evidence that endothelial cell growth factor beta is the precursor of both endothelial cell growth factor alpha and acidic fibroblast growth factor.  
#cross-references MUID:87016918



#accession B25043  
#molecule\_type protein  
#residues 2-155 #label BUR  
#note this form was designated beta endothelial cell growth factor

#accession C25043  
#molecule\_type protein  
#residues 16-155 #label BU2  
#note this form was designated acidic fibroblast growth factor

#accession A25043  
#molecule\_type protein  
#residues 22-155 #label BU3  
#note this form was designated alpha endothelial cell growth factor

REFERENCE A24539  
#authors Strydom, D.J.; Harper, J.W.; Lobb, R.R.  
#journal Biochemistry (1986) 25:945-951  
#title Amino acid sequence of bovine brain derived class 1 heparin-binding growth factor.

#cross-references MUID:86187766  
#accession A24539  
#molecule\_type protein  
#residues 16-155 #label STR

REFERENCE A60884  
#authors Thomas, K.A.; Gimenez-Gallego, G.; Rios-Candelore, M.; DiSalvo, J.  
#journal J. Protein Chem. (1987) 6:163-171  
#title Primary structure and mitogenic and angiogenic activities of brain-derived acidic fibroblast growth factor.

#accession A60884  
#molecule\_type protein  
#residues 16-155 #label THO

REFERENCE A37892  
#authors Kuo, M.D.; Huang, S.S.; Huang, J.S.  
#journal J. Biol. Chem. (1990) 265:16455-16463  
#title Acidic fibroblast growth factor receptor purified from bovine liver is a novel protein tyrosine kinase.

#cross-references MUID:90375514  
#accession A37892  
#molecule\_type protein  
#residues 22-30, 'X', 32-38 #label KU2  
#note this form was designated brain-derived growth factor A

#accession B37892  
#molecule\_type protein  
#residues 62-76, 'X', 78-86 #label KUO  
#note this sequence is an amino-terminal fragment of a form designated as brain-derived growth factor B

REFERENCE A61198  
#authors Hill, C.E.; Belford, D.A.; Godovac-Zimmermann, J.; Hendry, I.A.  
#journal Brain Res. Dev. Brain Res. (1991) 63:13-19  
#title Class 1 heparin binding growth factor promotes the differentiation but not the survival of ciliary neurones in vivo.

#cross-references MUID:92164087  
#accession A61198  
#molecule\_type protein  
#residues 11-26; 28-50; 53-110, 'H', 112, 'NTY'; 134-155 #label HIL

REFERENCE I46024  
#authors Philippe, J.M.; Renaud, F.; Desset, S.; Laurent, M.; Mallet, J.; Courtois, Y.; Edwards, J.B.  
#journal Biochem. Biophys. Res. Commun. (1992) 188:843-850  
#title Cloning of two different 5' untranslated exons of bovine acidic fibroblast growth factor by the single strand ligation to single-stranded cDNA methodology.

#cross-references MUID:93075172  
#accession I46024  
#status translated from GB/EMBL/DBJ  
#molecule\_type mRNA  
#residues 1-18 #label PH2

#cross-references EMBL:X56446; NID:9411; PIDN:CAA47063.1; PID:g412  
#accession A34477  
#authors Sasaki, H.; Hoshi, H.; Hong, Y.M.; Suzuki, T.; Kato, T.;

Sasaki, H.; Saito, M.; Youki, H.; Karube, K.; Konno, S.; Onodera, M.; Saito, T.; Aoyagi, S.  
#journal J. Biol. Chem. (1989) 264:17608-17612  
#title Purification of acidic fibroblast growth factor from bovine heart and its localization in the cardiac myocytes.

#cross-references MUID:90008933  
#accession A34477  
#status preliminary  
#molecule\_type protein  
#residues 16-24; 121-127; 134-143 #label SAS  
#experimental\_source heart

COMMENT The acidic and basic fibroblast growth factors are the major endothelial-cell growth factors. Both are angiogenic agents in vivo and are potent mitogens for a variety of mesoderm-derived cell types in vitro (although bFGF is 30-100 times more potent than aFGF in stimulating the proliferation of normal diploid cells). There are differences in the tissue distribution and concentration of these two growth factors.

COMMENT This protein binds heparin, although less strongly than does bFGF. There are some sequence similarities between residues 117-136 (a region flanked by Lys-Lys dipeptides) and a number of neuropeptides, including a gastrin-releasing peptide from the pig

...  
Note: remainder of annotations omitted.

Query Match 51.1%; Score 926; DB 1; Length 155;  
Best Local Similarity 91.2%; Pred. No. 1.17e-170;  
Matches 125; Conservative 7; Mismatches 5; Indels 0; Gaps 0;

Db 19 PLGNYKKPKLLYCSNGGYFLRLPDGTVGTRDSQHIQLCAESIGEYVIKSTGQ 78  
QY 118 PVANYKKPKLLYCSNGGHFLRLPDGTVGTRDSQHIQLCAESVGEYVIKSTGQ 177  
I:|||||  
Db 79 FLAMTDGLLYGSGTPNEECFLERLEENHYNTYISKHAENFVGLKNGRSKLGPRPT 138  
QY 178 YLAMTDGLLYGSGTPNEECFLERLEENHYNTYISKHAENFVGLKNGRSKLGPRPT 237  
I:|||||  
Db 139 HFGOKAILFLPLPVSSD 155  
QY 238 HYGOKAILFLPLPVSSD 254  
I:|||||

RESULT 7  
ENTRY A60130 #type complete  
TITLE acidic fibroblast growth factor - chicken  
ALTERNATE\_NAMES endothelial cell growth factor  
ORGANISM #formal\_name Gallus gallus #common\_name chicken  
DATE 03-Mar-1993 #sequence\_revision 03-Mar-1993 #text\_change 16-Jul-1999

ACCESSIONS A60130; S02639  
REFERENCE A60130  
#authors Schnuerch, H.; Risau, W.  
#journal Development (1991) 111:1143-1154  
#title Differentiating and mature neurons express the acidic fibroblast growth factor gene during chick neural development

#cross-references MUID:91347925  
#accession A60130  
#status preliminary  
#molecule\_type mRNA  
#residues 1-155 #label SCH

#cross-references GB:S63263; NID:9234372; PIDN:AAB19629.1; PID:9234373  
REFERENCE S02639  
#authors Risau, W.; Gautschi-Sova, P.; Boehlen, P.  
#journal EMBO J. (1988) 7:959-962  
#title Endothelial cell growth factors in embryonic and adult chick brain are related to human acidic fibroblast growth factor.

#cross-references MUID:88296438  
#accession S02639  
#molecule\_type protein  
#residues 22-30, 'X', 32-44, 'X', 46-48 #label RIS

CLASSIFICATION #superfamily fibroblast growth factor  
KEYWORDS growth factor

```

#title      Human ryudocan core protein: Molecular cloning and
            characterization of the cDNA, and chromosomal localization
            of the gene.
#cross-references MUID:93176185
#accession  J01457
            #molecule_type mRNA
            ##residues      1-198 ##label KOJ
            ##cross-references DDBJ:D13292; NID:g286020; PID:d1003053; PID:g286021
REFERENCE
#authors    David, G.; van der Schueren, B.; Marynen, P.; Cassiman, J.J.;
            van den Berghe, H.
#journal    J. Cell Biol. (1992) 118:961-969
#title      Molecular cloning of amphiglycan, a novel integral membrane
            heparan sulfate proteoglycan expressed by epithelial and
            fibroblastic cells.
#cross-references MUID:92363936
#accession  S26695
            ##status      preliminary
            ##molecule_type mRNA
            ##residues      1-11,'L',13-198 ##label DAV
            ##cross-references EMBL:X67016; NID:g28679; PID:g28680
GENETICS
#map_position 20q12
KEYWORDS    chondroitin sulfate proteoglycan; core protein; glycoprotein;
            heparan sulfate; transmembrane protein
FEATURE
1-18        #domain signal sequence #status predicted #label SIC\
19-198      #product ryudocan #status predicted #label MAT\
146-170     #domain transmembrane #status predicted #label TMM\
39,61,63    #binding_site heparan sulfate (Ser) (covalent) #status
            predicted
SUMMARY     #length 198 #molecular-weight 21641 #checksum 4522

Query Match      45.6%; Score 827; DB 2; Length 198;
Best Local Similarity 98.3%; Pred. No. 8.96e-149;
Matches 119; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Db 1 MAPARFALLFFVGVAESIRETEVIDPQDLLEGYFSGALPDEDVVGQESDDFEL 60
QY 1 MAPARFALLFFVGVAESIRETEVIDPQDLLEGYFSGALPDEDVVGQESDDFEL 60

Db 61 SGSGDLDDLEDSMIGPEVVHVPLVLDNHIPIERAGSGSQVPTPKKLENEVIPKRISFVE 120
QY 61 SGSGDLDDLEDSMIGPEVVHVPLVLDNHIPIERAGSGSQVPTPKKLENEVIPKRISFVA 120

Db 121 E 121
QY 121 N 121

RESULT 10
ENTRY   A42410 #type complete
TITLE   ryudocan precursor - rat
        amphiglycan; heparan sulfate proteoglycan core protein
        ryudocan
ORGANISM
        #formal_name Rattus norvegicus #common_name Norway rat
        04-Mar-1993 #sequence_revision 18-Nov-1994 #text_change
        20-Mar-1998
ACCESSIONS
REFERENCE A42410
#authors  Kojima, T.; Shworak, N.W.; Rosenberg, R.D.
#journal  J. Biol. Chem. (1992) 267:4870-4877
#title    Molecular cloning and expression of two distinct
        CDNA-encoding heparan sulfate proteoglycan core proteins
        from a rat endothelial cell line.
#cross-references MUID:92165852
#accession A42410
            ##status      preliminary
            ##molecule_type mRNA
            ##residues      1-202 ##label KOJ
            ##cross-references GB:M81786; NID:g206922; PID:g206923
            ##experimental_source endothelial cell line
            ##note         sequence extracted from NCBI backbone (NCBIN:84028,

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Db   116 FLAMKEDGRLLAKCATECFEERLESNNYNTYSRKYSD--WVVALKRTGQYKPGPKT 173
      :||| ||| : |||:||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
Qy   178 YLAMDTDGLLYGSOTNEECFLERLEENHYNTYISKHAEKNWFVLKKNGSCRGPRT 237
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Db   174 GPGOKAILFLPWSAKS 189
Qy   238 HYGOKAILFLPLPVSS 253
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RESULT 12
ENTRY    S00185          #type complete
TITLE     basic fibroblast growth factor - sheep
ALTERNATE_NAMES  prostatropin
ORGANISM  #formal_name Ovis orientalis aries, Ovis ammon aries
           #common_name domestic sheep
DATE      10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change
           10-Sep-1999
ACCESSIONS  S00185
REFERENCE   S00185
#authors    Simpson, R.J.; Moritz, R.L.; Lloyd, C.J.; Fabri, L.J.; Nice,
            E.C.; Rubira, M.R.; Burgess, A.W.
#journal    FEBS Lett. (1987) 224:128-132
#title      Primary structure of ovine pituitary basic fibroblast growth
            factor.
#crosso-references MWID:88055577
#accesion    S00185
#molecule_type protein
#residues    1-146 #label SIM
CLASSIFICATION  superfamily fibroblast growth factor
KEYWORDS        growth factor; heparin binding; mitogen
FEATURE         18-22
               107-110
SUMMARY         #region heparin binding #status predicted\
                #region heparin binding #status predicted
                #length 146 #molecular-weight 16434 #checksum 3560

Query Match      28.7%; Score 521; DB 1; Length 146;
Best Local Similarity 55.1%; Pred. No. 2,80e-82;
Matches 75; Conservative 22; Mismatches 37; Indels 2; Gaps 1;

Db   13 PPGFKDPRLRYCKNGGFRLRHPOGRVDGVREKSDPHKLQLOAEEGVVSIKGVCANR 72
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Qy   118 PVANYKKPLLKLYCSNGCHFLRLPDGTVDCTDRDSQHILQLLSAESGEVIKSTEQ 177
      |||::| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
Db   73 YLAMEKDGRLALKCVTDCEFFERLESNNYNTYSRKYSS--SWYVALKRTGQYKLGPKT 130
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Qy   178 YLAMDTDGLLYGSOTNEECFLERLEENHYNTYISKHAEKNWFVLKKNGSCRGPRT 237
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Db   131 GPGOKAILFLPWSAKS 146
Qy   238 HYGOKAILFLPLPVSS 253
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RESULT 13
ENTRY    GRBOB          #type fragment
TITLE     Basic fibroblast growth factor precursor - bovine (fragment)
ALTERNATE_NAMES  bFGF; kidney-derived growth factor; prostatropin
ORGANISM  #formal_name Bos primigenius taurus #common_name cattle
           #Aug-1986 #sequence_revision 02-Jun-1995 #text_change
           10-Sep-1999
ACCESSIONS  A24663; A32878; A33784; A61550; A61551; A60310; A61094;
            A01386; A60316; A22054; A24819
REFERENCE   A34290
#authors    Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman,
            J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal    Science (1986) 233:545-548
#title      Nucleotide sequence of a bovine clone encoding the angiotensin
            protein, basic fibroblast growth factor.
#crosso-references MWID:86261806
#accesion    A24663
#molecule_type mRNA
#residues    3-157 #label ABR
##crosso-references GB:M13440; NID:g163049; PIDN:AAA30518.1; PID:g163050
##experimental_source pituitary gland

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#status      not compared with conceptual translation
#molecule_type  DNA
#residues    1-155 #label AB2
#note        the authors translated the codon GAA for residue 108 as Gly

REFERENCE
#authors      AS4316
              Shimoyama, Y.; Gotoh, M.; Ino, Y.; Sakamoto, M.; Kato, K.;
              Hirohashi, S.
#journal      Jpn. J. Cancer Res. (1991) 82:1263-1270
#title        Characterization of high-molecular-mass forms of basic
              fibroblast growth factor produced by hepatocellular
              carcinoma cells: possible involvement of basic fibroblast
              growth factor in hepatocarcinogenesis.
#cross-references  MUID:92091228
#accession    A54316
#molecule_type  protein
#residues     'XX',86-88,'X',90-91,'X',93-95 #label SH3
#experimental_source  C-L121 hepatocellular carcinoma cell line
#note         sequence extracted from NCBI backbone (NCBIP:71595)
#accession    B54316
#molecule_type  protein
#residues     'XX','19','X','21-29 #label SH2
#note         sequence extracted from NCBI backbone (NCBIP:71594)
#accession    A3624
#authors      Feige, J.J.; Bradley, J.D.; Fryburg, K.; Farris, J.; Cousins
              L.C.; Barr, P.J.; Baird, A.
#journal      J. Cell Biol. (1989) 109:3105-3114
#title        Differential effects of heparin, fibronectin, and laminin on
              the phosphorylation of basic fibroblast growth factor by
              protein kinase C and the catalytic subunit of protein
              kinase A.
#cross-references  MUID:90078343
#accession    A3624
#status      preliminary
#molecule_type  protein
#residues     57-210 #label FBI

REFERENCE
#authors      AS2824
              Story, M.T.; Esch, F.; Shimasaki, S.; Sasse, J.; Jacobs,
              S.C.; Lawson, R.K.
#journal      Biochem. Biophys. Res. Commun. (1987) 142:702-709
#title        Amino-terminal sequence of a large form of basic fibroblast
              growth factor isolated from human benign prostatic
              hyperplastic tissue.
#cross-references  MUID:87156686
#accession    A25824
#molecule_type  protein
#residues     57-77 #label STO
#experimental_source  prostate

REFERENCE
#authors      A30122
              Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal      Biochem. Biophys. Res. Commun. (1986) 135:541-548
#title        Human brain-derived acidic and basic fibroblast growth
              factors: amino terminal sequences and specific mitogenic
              activities.
#cross-references  MUID:86186784
#accession    B24243
#molecule_type  protein
#residues     55-102,'X',104-105 #label GIM
#experimental_source  brain

REFERENCE
#authors      A91364
              Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
#journal      FEBS Lett. (1986) 204:203-207
#title        Partial molecular characterization of endothelial cell
              mitogens from human brain: acidic and basic fibroblast
              growth factors.
#cross-references  MUID:86275260
#accession    B24301
#molecule_type  protein
#residues     55-88,'X',90-98,'X',100 #label GAU

REFERENCE
#authors      S42242
              Sommer, A.; Brewer, M.T.; Thompson, R.C.; Moscatelli, D.;
              Presta, M.; Rifkin, D.B.
#journal      Biochem. Biophys. Res. Commun. (1987) 144:543-550

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#title      A form of human basic fibroblast growth factor with an
#cross-references MUID:87213238
#accession   S42242
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#residues    54-210 #label SOM
#cross-references EMBL:M17599; NID:g183086; PIDN:AAA52534.1;
                PID:g183087

REFERENCE
#authors    Pantollano, M.W.; Horlick, R.A.; Springer, B.A.; Van Dyk,
                D.E.; Tobey, T.; Wetmore, D.R.; Lear, J.D.; Nahapetian,
                A.T.; Bradley, J.D.; Sisk, W.P.
#journal    Biochemistry (1994) 33:10229-10248
#title      Multivalent ligand-receptor binding interactions in the
                fibroblast growth factor system produce a cooperative
                growth factor and heparin mechanism for receptor
                dimerization.
#cross-references MUID:94347757
#accession   B55784
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REFERENCE
#authors    Watson, R.; Anthony, F.; Pickett, M.; Lambden, P.; Masson,
                G.M.; Thomas, E.J.
#journal    Biochem. Biophys. Res. Commun. (1992) 187:1227-1231
#title      Reverse transcription with nested polymerase chain reaction
                shows expression of basic fibroblast growth factor
                transcripts in human granulosa and cumulus cells from in
                vitro fertilisation patients.
#cross-references MUID:93038590
#accession   I52267
#status      preliminary; translated from GB/EMBL/DBJ
#molecule_type mRNA
#residues    95-182 #label RES
#cross-references GB:S47380; NID:q256535
#experimental_source granulosa cells
REFERENCE
#authors    Patry, V.; Bugler, B.; Amalric, F.; Prome, J.C.; Prats, H.
                FEBS Lett. (1994) 349:23-28
#journal    Purification and characterization of the 210-amino acid
                recombinant basic fibroblast growth factor form (FGF-2).
#title      Recombinant basic fibroblast growth factor form (FGF-2).
#cross-references MUID:94320639
#accession   S46253
#molecule_type protein
#residues    39-53;65-88 #label PAT
#note        recombinant gene expressed in Escherichia coli
GENETICS
#gene       GDB:FGF2; FGFB
#cross-references GDB:119910; OMIM:134920
#map_position 4q23-4q27
#start_codon CTG
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS      alternative initiators; angiogenesis; growth factor; heparin
                binding; mitogen
FEATURE
1-210         #product basic fibroblast growth factor, 22.5K form
65-210         #status predicted #label MA2\
                #product basic fibroblast growth factor, 18K form
82-86         #status predicted #label MA2\
                #region heparin binding #status predicted\
171-174        #region heparin binding #status predicted
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Db 77 PPGHFKDKRLKCKNGGFFLRHPDGRVDGVREKSDPHKQLQAEERGVVSIKGVCANR 136
Qy 118 PVANIKPKLLKLLCSNGGHFLRLPDGTGTRDRSDQHIQLQLSAESVGEYIKSTETGQ 177
Db 137 YLAMKEDGRLLASKCVTECFERLESNNYNTYRSRYT--SWYVALKRTGYKLGSKT 194
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Qy 178 YLAMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 237

Db 195 GPGOKAILFLPMSAKS 210
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Qy 238 HYGOKAILFLPLPVSS 253

RESULT 15
ENTRY      C37360 #type complete
TITLE      basic fibroblast growth factor - mouse
ORGANISM   #formal_name Mus musculus #common_name house mouse
DATE       17-Apr-1993 #sequence_revision 17-Apr-1993 #text_change
                16-Jul-1999
ACCESSIONS C37360
REFERENCE   A37360
#authors    Hebert, J.M.; Basilico, C.; Goldfarb, M.; Haub, O.; Martin,
                G.R.
#journal    Dev. Biol. (1990) 138:454-463
#title      Isolation of cDNAs encoding four mouse FGF family members and
                characterization of their expression patterns during
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#cross-references MUID:90201563
#accession   C37360
#status      preliminary
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SUMMARY     #length 154 #molecular-weight 17153 #checksum 2906

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Qy 118 PVANIKPKLLKLLCSNGGHFLRLPDGTGTRDRSDQHIQLQLSAESVGEYIKSTETGQ 177
Db 81 YLAMKEDGRLLASKCVTECFERLESNNYNTYRSRYT--SWYVALKRTGYKLGSKT 138
Qy 178 YLAMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 237
Db 139 GPGOKAILFLPMSAKS 154
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Qy 238 HYGOKAILFLPLPVSS 253

Search completed: Tue Aug 29 15:59:50 2000
Job time : 60 secs.
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**MT.**

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mpsrch_pp protein - protein database search, using Smith-Waterman algorithm
on: Tue Aug 29 15:56:48 2000; MasPar time 9.39 Seconds
838.068 Million cell updates/sec
Output not generated.

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Result No.	Query			DB	ID	Description	Pred. No.
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1	989	54.6	155	1	FGF1_HUMAN	HEPARIN-BINDING GROWTH	3.556e-20
2	976	53.8	155	1	FGF1_MOUSE	HEPARIN-BINDING GROWTH	6.45e-20
3	973	53.7	155	1	FGF1_MESAO	HEPARIN-BINDING GROWTH	3.84e-20
4	958	52.8	152	1	FGF1_PIG	HEPARIN-BINDING GROWTH	2.08e-20
5	936	51.1	155	1	FGF1_BOVIN	HEPARIN-BINDING GROWTH	2.10e-19
6	926	51.1	155	1	FGF1_CHICK	HEPARIN-BINDING GROWTH	2.10e-19
7	827	45.6	198	1	SCG4_HUMAN	SYNDECAN-4 PRECURSOR (	9.76e-16
8	546	30.1	202	1	SC4_RAT	SYNDECAN-4 PRECURSOR (	7.79e-99
9	527	29.1	158	1	FGF2_CHICK	HEPARIN-BINDING GROWTH	2.91e-94
10	521	28.7	155	1	FGF2_SHEEP	HEPARIN-BINDING GROWTH	8.03e-93
11	521	28.7	155	1	FGF2_BOVIN	HEPARIN-BINDING GROWTH	8.03e-93
12	514	28.4	155	1	FGF2_HUMAN	HEPARIN-BINDING GROWTH	3.83e-91
13	513	28.3	154	1	FGF2_MOUSE	HEPARIN-BINDING GROWTH	6.65e-91
14	513	28.3	154	1	FGF2_RAT	HEPARIN-BINDING GROWTH	6.65e-91
15	505	27.9	198	1	SC4_MOUSE	SYNDECAN-4 PRECURSOR (	5.48e-89
16	503	27.7	156	1	FGF2_MONDO	HEPARIN-BINDING GROWTH	1.65e-88
17	494	27.2	157	1	FGF2_XENLA	HEPARIN-BINDING GROWTH	2.33e-86
18	471	26.0	137	1	FGF2_RABIT	HEPARIN-BINDING GROWTH	7.01e-81
19	360	19.9	209	1	FGF9_XENLA	GLIA-ACTIVATING FACTOR	6.73e-55
20	350	19.3	208	1	FGF9_RAT	GLIA-ACTIVATING FACTOR	1.32e-52
21	350	19.3	208	1	FGF9_HUMAN	GLIA-ACTIVATING FACTOR	1.32e-52
22	350	19.3	208	1	FGF9_MOUSE	GLIA-ACTIVATING FACTOR	1.32e-52
23	329	18.1	207	1	FGFG_HUMAN	FIBROBLAST GROWTH FACT	8.09e-48

RX MEDLINE: 92019819.  
RA Wang W.P., Quick D., Balcerzak S.P., Needleman S.W., Chiu I.M.;  
RT "Cloning and sequence analysis of the human acidic fibroblast growth  
RT factor gene and its preservation in leukemia patients.";  
RL Oncogene 6:1521-1529(1991).  
RN [6]  
RX SEQUENCE FROM N.A.  
RX MEDLINE: 92202857.  
RA Li Y.L., Kha H., Golden J.A., Migchielsen A.A.J., Goetzl E.J.,  
RA Turck E.J.;  
RT "An acidic fibroblast growth factor protein generated by alternate  
RT splicing acts like an antagonist.";  
RL J. Exp. Med. 175:1073-1080(1992).  
RN [7]  
RX SEQUENCE OF 1-154 FROM N.A.  
RX MEDLINE: 94069734.  
RA Zhao X.M., Yeoh T.K., Hiebert M., Frist W.H., Miller G.G.;  
RT "The expression of acidic fibroblast growth factor (heparin-binding  
RT growth factor-1) and cytokine genes in human cardiac allografts and T  
RT cells.";  
RL Transplantation 56:1177-1182(1993).  
RN [8]  
RX SEQUENCE OF 1-40 FROM N.A.  
RX MEDLINE: 90365758.  
RA Crumley G., Dionne C.A., Jaye M.;  
RT "The gene for human acidic fibroblast growth factor encodes two  
RT upstream exons alternatively spliced to the first coding exon.";  
RL Biochem. Biophys. Res. Commun. 171:7-13(1990).  
RN [9]  
RX SEQUENCE OF 16-155.  
RX MEDLINE: 86296647.  
RA Harper J.W., Strydom D.J., Lobb R.R.;  
RT "Human class I heparin-binding growth factor: structure and homology  
RT to bovine acidic brain fibroblast growth factor.";  
RL Biochemistry 25:4097-4103(1986).  
RN [10]  
RX SEQUENCE OF 16-155.  
RX MEDLINE: 86295741.  
RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;  
RT "The complete amino acid sequence of human brain-derived acidic  
RT fibroblast growth factor.";  
RL Biochem. Biophys. Res. Commun. 138:611-617(1986).  
RN [11]  
RX SEQUENCE OF 16-155.  
RX MEDLINE: 87048871.  
RA Gautschi-Sova P., Mueller T., Boehlen P.;  
RT "Amino acid sequence of human acidic fibroblast growth factor.";  
RL Biochem. Biophys. Res. Commun. 140:874-880(1986).  
RN [12]  
RX SEQUENCE OF 16-47.  
RX MEDLINE: 86186784.  
RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;  
RT "Human brain-derived acidic and basic fibroblast growth factors:  
RT amino terminal sequences and specific mitogenic activities.";  
RL Biochem. Biophys. Res. Commun. 135:541-548(1986).  
RN [13]  
RX SEQUENCE OF 16-49.  
RX MEDLINE: 86275260.  
RA Gautschi P., Frater-Schroeder M., Boehlen P.;  
RT "Partial molecular characterization of endothelial cell mitogens from  
RT human brain: acidic and basic fibroblast growth factors.";  
RL FEBS Lett. 204:203-207(1986).  
RN [14]  
RX X-RAY CRYSTALLOGRAPHY (2.0 ANGSTROMS).  
RX MEDLINE: 96194129.  
RA Blaber M., Disalvo J., Thomas K.A.;  
RT "X-ray crystal structure of human acidic fibroblast growth factor.";  
RL Biochemistry 35:2086-2094(1996).  
RN [15]  
RX STRUCTURE BY NMR OF 24-155.  
RX MEDLINE: 94358885.  
RA Pineda-Lucena A., Gimenez M.A., Nieto J.L., Santoro J., Rico M.,  
RA Gimenez-Gallego G.;  
RT "1H-NMR assignment and solution structure of human acidic fibroblast  
RT growth factor activated by inositol hexasulfate.";  
RL J. Mol. Biol. 242:81-98(1994).  
RN [16]  
RX STRUCTURE BY NMR OF 24-155.  
RX MEDLINE: 97107535.  
RA Pineda-Lucena A., Gimenez M.A., Lozano R.M., Nieto J.L., Santoro J.,  
RA Rico M., Gimenez-Gallego G.;  
RT "Three-dimensional structure of acidic fibroblast growth factor in  
RT solution: effects of binding to a heparin functional analog.";  
RL J. Mol. Biol. 264:162-178(1996).  
RN [17]  
RX STRUCTURE BY NMR OF 25-155.  
RX MEDLINE: 98387896.  
RA Lozano R.M., Gimenez M., Santoro J., Rico M., Gimenez-Gallego G.;  
RT "Solution structure of acidic fibroblast growth factor bound to 1,3,  
RT 6-naphthalenesulfonate: a minimal model for the anti-tumoral  
RT action of suramin and suradistas.";  
RL J. Mol. Biol. 281:895-915(1998).  
CC [1-] FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC [1-] SUBUNIT: MONOMER.  
CC [1-] MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY  
CC THAN DOES BFGF.  
CC [1-] SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
CC -----  
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CC or send an email to [license@sib-sib.ch](mailto:license@sib-sib.ch)).  
CC -----  
DR EMBL: M1361; AAA79245.1; -  
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DR EMBL: M30490; AAA52446.1; JOINED.  
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DR EMBL: S67291; AAB29057.1; -  
DR EMBL: X65778; CAA46661.1; -  
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DR PIR: A24301; A24301.  
DR PIR: A24662; A24662.  
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DR PIR: A26386; A26386.  
DR PIR: A33665; A33665.  
DR PIR: S18217; S18217.  
DR PDB: 2AFG; 15-OCT-95.  
DR PDB: 1AXM; 22-APR-98.  
DR PDB: 2AXM; 22-APR-98.  
DR PDB: 1RML; 11-NOV-98.  
DR MIM: 131220; -  
DR PFAM: PF00167; FGF; 1.  
DR PRINTS: PR00262; ILJHGF.  
DR PRINTS: PR00263; HBGFGE.  
DR PROSITE: PS00247; HBGF; 1.  
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FT PROPEP 1 15  
FT CHAIN 16 155  
FT MOD\_RES 2 2  
FT BINDING 24 28  
FT BINDING 113 116  
FT SEQUENCE 155 AA; 17460 MW; F586E8BF09F1580 CRC64;  
SQ



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or send an email to license@isb-sib.ch).

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CC EMBL; X14232; CAA32448.1; -  
CC CC EMBL; M30641; AAA37618.1; -  
CC DR EMBL; U36459; AAC52969.1; -  
DR DR EMBL; U36457; AAC52969.1; JOINED.  
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DR EMBL; U67610; AAC52907.1; -  
DR PIR; S04147; S04147.  
DR PIR; D37360; D37360.  
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DR MGD; MG1:95515; FGF1.  
DR PFAM; PF00167; FGF; 1.  
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DR PRINTS; PR00263; HBGF.FGF.  
DR PROSITE; PS00247; HBGF\_FGF; 1.  
KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
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Query Match 53.8%; Score 976; DB 1; Length 155;  
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112 IPKRIS-PVANYKKPKLLYCNSGGHFLRIILPDGTVDGTRDRSDQHIOQLSAESVGEVYI 170  
Dl : :::::::::::::::  
Db 72 KGTETGOYLAMDTEGLYGSGTPTNEECFLERLEENHYNTYTSKKHAENFVGLKNKS 131  
QY : :::::::::::::::  
171 KSDETGOYLAMDTEGLYGSGTPTNEECFLERLEENHYNTYTSKKHAENFVGLKNKS 230  
Dl : :::::::::::::::  
Db 132 CKRGPRTHYGOKAILFLPLPVSSD 155  
QY : :::::::::::::::  
231 CKRGPRTHYGOKAILFLPLPVSSD 254

RESULT 3  
ID FGF1\_MESAU STANDARD; PRT; 155 AA.  
AC P34004;  
DT 01-FEB-1994 (Rel. 28, Created)  
DT 01-FEB-1994 (Rel. 28, Last sequence update)  
DT 15-JUL-1999 (Rel. 38, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST  
DE GROWTH FACTOR) (AFGF).  
OS FGF1 OR FGF-1.  
OS Mesocricetus auratus. (Golden hamster).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Cricetinae;  
OC Mesocricetus.  
RN [1]  
RP SEQUENCE FROM N.A.  
RX MEDLINE; 90270291.  
RA Hall J.A., Harris M.A., Malark M., Mansson P.E., Zhou H., Harris S.E.;  
RT "Characterization of the hamster DDT-1 cell afGF/HBGF-I gene and cDNA  
and its modulation by steroids.";  
RL J. Cell. Biochem. 43:17-26(1990).  
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -!- SUBUNIT: MONOMER.  
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY  
CC THAN DOES HBGF.  
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
DR PIR; A60721; A60721.  
DR HSSP; P05230; 2AXM.  
DR PFAM; PF00167; FGF; 1.  
DR PRINTS; PR00262; ILLHBGF.

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DR  PIR; S03954; S03954.
DR  HSSP; P05230; 2AXM.
DR  PFAM; PF00167; FGF; 1.
DR  PROSITE; PS00247; HBGF_FGF; 1.
KW  Growth factor; Mitogen; Vascularization; Heparin-binding.
FT  PROPEP 1 15
FT  CHAIN 16 >152
FT  CHAIN 22 >152
FT  BINDING 24 28
FT  BINDING 113 116
FT  CONFLICT 31 31
FT  CONFLICT 39 39
FT  NON_TER 152 152
FT  SEQUENCE 152 AA; 17103 MW; AE85380A92F9ABF4 CRC64;
      Query Match 52.8%; Score 958; DB 1; Length 152;
      Best Local Similarity 96.3%; Pred.No. 2.08e-200;
      Matches 129; Conservative 2; Mismatches 3; Indels 0; Gaps
DB  19 PPGNYKKPLLYCSNGGHFLRLILPDGTVGTRDRSDQHILQLLSAESVGEVYIKSTETGQ 78
      I :|||||
QY  118 PVANYKKPLLYCSNGGHFLRLILPDGTVGTRDRSDQHILQLLSAESVGEVYIKSTETGQ 177
      I :|||||
DB  79 YLAMTSGLLYGSQTPSECLFLERLEENHYTYTSKKHAENWFVGLKKNGSKRGPRPT 138
      I :|||||
QY  178 YLAMTDGLLYGSQTPNEECFLERLEENHYTYTSKKHAENWFVGLKKNGSKRGPRPT 237
      I :|||||
DB  139 HYGOKAILFLPLPV 152
QY  238 HYGOKAILFLPLPV 251
      I :|||||
RESULT 5
ID  FGF1_BOVIN STANDARD; PRT; 155 AA.
AC  P03968;
DT  23-OCT-1986 (Rel. 02, Created)
DT  01-MAR-1989 (Rel. 10, Last sequence update)
DT  15-JUL-1999 (Rel. 38, Last annotation update)
DE  HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FTBROBLAST
DE  GROWTH FACTOR) (AFGF) (PROSTATROPIN) (ENDOTHELIAL CELL GROWTH FACTOR
DE  BETA AND ALPHA CHAINS) (ACIDIC EYE-DERIVED GROWTH FACTOR II) (EDGF
DE  II).
OS  FGF1 OR FGF-1 OR FGFA OR HBGF-1 OR AFGF.
OS  Bos taurus (Bovine).
OC  Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC  Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;
OC  Bovidae; Bovinae; Bos.
RN  [1]
RS  SEQUENCE FROM N.A.
RC  TISSUE-RETINA;
RC  MEDLINE; 89083506.
RA  Halley C., Courtois Y., Laurent M.;
RA  "Nucleotide sequence of bovine acidic fibroblast growth factor cDNA."
RL  Nucleic Acids Res. 16:10913-10913(1988).
RN  [2]
RS  SEQUENCE FROM N.A.
RC  TISSUE-RETINA;
RC  MEDLINE; 89078619.
RA  Alterio J., Halley C., Brou C., Soussi T., Courtois Y., Laurent M.;
RT  "Characterization of a bovine acidic FGF cDNA clone and its
RT  expression in brain and retina.";
RN  FEBS Lett. 242:41-46(1988).
RN  [3]
RS  SEQUENCE OF 2-155.
RP  MEDLINE; 87016918.
RA  Burgess W.H., Mehlman T., Marshak D.R., Fraser B.A., Maciag T.;
RT  "Structural evidence that endothelial cell growth factor beta is the
RT  precursor of both endothelial cell growth factor alpha and acidic
RT  fibroblast growth factor.";
RN  Proc. Natl. Acad. Sci. U.S.A. 83:7216-7220(1986).
RN  [4]
RS  SEQUENCE OF 2-155.
RP  MEDLINE; 87026586.

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FT DOMAIN 171 198 CYTOPLASMIC (POTENTIAL).  
 FT CARBOHYD 39 39 O-LINKED (GLYCOSAMINOGLYCAN) (POTENTIAL).  
 FT CARBOHYD 61 61 O-LINKED (GLYCOSAMINOGLYCAN) (POTENTIAL).  
 FT CARBOHYD 63 63 O-LINKED (GLYCOSAMINOGLYCAN) (POTENTIAL).  
 FT CONFLICT 12 12 F > L (IN REF. 1).  
 SQ SEQUENCE 198 AA: 21641 MW: 8229AA2733F77A10 CRC64;  
 Query Match 45.6%; Score 827; DB 1; Length 198;  
 Best Local Similarity 98.3%; Pred. No. 9,76e-168;  
 Matches 119; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Db 1 MAPARLALLFFVGGVAESIRETEVIDPDLLLEGYFSGALPDDEVDVVGQESDDDEL 60  
 QY 1 MAPARLALLFFVGGVAESIRETEVIDPDLLLEGYFSGALPDDEVDVVGQESDDDEL 60  
 Db 61 SSGSDLDLSDSMIGPVRVHPLVPLDNHPIPERAGSGOVTEPKKLEENEVIKRIISPYE 120  
 QY 61 SSGSDLDLSDSMIGPVRVHPLVPLDNHPIPERAGSGOVTEPKKLEENEVIKRIISPYA 120  
 121 E 121  
 121 N 121

RESULT 8  
 ID SDC4\_RAT STANDARD; PRT; 202 AA.  
 AC P34901;  
 DT 01-FEB-1994 (Rel. 28, Created)  
 DT 01-FEB-1994 (Rel. 28, Last sequence update)  
 DT 15-FEB-2000 (Rel. 39, Last annotation update)  
 DE SYNDSCAN-4 PRECURSOR (RYUDOCAN CORE PROTEIN).  
 GN SDC4 OR SYND4.  
 OS Rattus norvegicus (Rat).  
 OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 92165852.  
 RA Kojima T., Shworak N.W., Rosenberg R.D.;  
 RT "Molecular cloning and expression of two distinct cDNA-encoding  
 RT heparan sulfate proteoglycan core proteins from a rat endothelial  
 RT cell line";  
 RL J. Biol. Chem. 267:4870-4877(1992).  
 RN [2]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 93266143.  
 RA Shworak N.W., Kojima T., Rosenberg R.D.;  
 RT "Isolation and characterization of ryudocan and syndecan heparan  
 RT sulfate proteoglycans, core proteins, and cDNAs from a rat  
 RT endothelial cell line";  
 RL Haemostasis 23:161-176(1993).  
 CC -1- FUNCTION: CELL SURFACE PROTEOGLYCAN THAT BEAR HEPARAN SULFATE.  
 CC -1- SUBCELLULAR LOCATION: TYPE I- MEMBRANE PROTEIN.  
 CC -1- SIMILARITY: BELONGS TO THE SYNDSCAN FAMILY OF INTEGRAL MEMBRANE  
 CC PROTEOGLYCANS.  
 CC  
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 CC or send an email to [license@isb-sib.ch](mailto:license@isb-sib.ch)).  
 CC  
 CC EMBL: M61786; AAA73167.1;  
 CC EMBL: S61868; AAB26725.1;  
 CC PIR: A42410; A42410.  
 CC DR PFAM: PF01034; Syndecan; 1.  
 CC DR PROSITE: PS00964; SYNDSCAN; 1.  
 CC DR Proteoglycan; Heparan sulfate; Transmembrane; Glycoprotein; Signal.  
 KW SIGNAL 1 23 POTENTIAL.  
 FT CHAIN 24 202 SYNDSCAN-4.  
 FT DOMAIN 24 149 EXTRACELLULAR (POTENTIAL).

FT TRANSMEM 150 174 POTENTIAL.  
 FT DOMAIN 175 202 CYTOPLASMIC (POTENTIAL).  
 FT CARBOHYD 44 44 O-LINKED (GLYCOSAMINOGLYCAN) (POTENTIAL).  
 FT CARBOHYD 55 55 O-LINKED (GLYCOSAMINOGLYCAN) (POTENTIAL).  
 FT CARBOHYD 67 67 O-LINKED (GLYCOSAMINOGLYCAN) (POTENTIAL).  
 SQ SEQUENCE 202 AA: 21962 MW: 5D9C8B3BF4C0D58A CRC64;  
 Query Match 30.1%; Score 546; DB 1; Length 202;  
 Best Local Similarity 72.4%; Pred. No. 7,79e-99;  
 Matches 89; Conservative 13; Mismatches 15; Indels 6; Gaps 4;

Db 1 MAPVCLFAPLALLLGGFPVAPGESIRETEVIDPDLLLEGYFSGALPDDEVDAGLEQDS 60  
 QY 1 MAPARLFA-LLLEFFVG--VA--ESTIRETEVIDPDLLLEGYFSGALPDDEVDVVGQES 55  
 Db 61 D-FEISGSGDLDLSDTEPRTPFVPSVPLDNHPIPERAGSGOVTEPKKLEENEVIKRI 119  
 QY 56 DFEISGSGDLDLSDTEPRTPFVPSVPLDNHPIPERAGSGOVTEPKKLEENEVIKRI 115  
 120 VPS 122  
 116 ISP 118

RESULT 9  
 ID FGF2\_CHICK STANDARD; PRT; 158 AA.  
 AC P48800;  
 DT 01-FEB-1996 (Rel. 33, Created)  
 DT 01-FEB-1996 (Rel. 33, Last sequence update)  
 DT 01-FEB-1996 (Rel. 33, Last annotation update)  
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST  
 DE GROWTH FACTOR) (BFGF).  
 GN FGF2 OR FGF-2.  
 OS Gallus gallus (Chicken).  
 OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;  
 OC Archosauria; Aves; Neognathae; Galliformes; Phasianinae;  
 OC Gallus.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 93246053.  
 RA Borja A.Z., Zeller R., Meijers C.;  
 RT "Expression of alternatively spliced bFGF first coding exons and  
 RT antisense mRNAs during chicken embryogenesis";  
 RL Dev. Biol. 157:110-118(1993).  
 CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
 CC -1- SUBUNIT: MONOMER.  
 CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES  
 CC AFGF.  
 CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
 CC  
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 CC  
 CC EMBL: M95707; AAA48617.1;  
 CC HSP: P09038; 1BFF.  
 CC PFAM: PF00167; FGF; 1.  
 CC DR PRINTS: PR00262; ILJHBGF.  
 CC DR PRINTS: PR00263; HBGFHGF.  
 CC PROSITE: PS00247; HBGF\_FGF; 1.  
 CC Growth factor; Mitogen; Vascularization; Heparin-binding.  
 KW PROPEP 1 12  
 FT CHAIN 13 158 HEPARIN-BINDING GROWTH FACTOR 2.  
 FT BINDING 30 34 HEPARIN (POTENTIAL).  
 FT BINDING 119 122 HEPARIN (POTENTIAL).  
 SQ SEQUENCE 158 AA: 17374 MW: 7969B684C17F1816 CRC64;



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FT STRAND 127 127
FT TURN 129 130
FT STRAND 133 133
FT TURN 136 138
FT STRAND 141 142
FT TURN 144 146
FT STRAND 148 151
FT TURN 155 155
SQ SEQUENCE 155 AA; 17250 MW; BEGCE70FA6107129 CRC64;

Query Match 28.7%; Score 521; DB 1; Length 155;
Best Local Similarity 55.1%; Pred. No. 8,03e-93;
Matches 75; Conservative 22; Mismatches 37; Indels 2; Gaps

Db 22 PPGHFKDPRKLYCKNGGFFLRHPDGRVDGVRKSPDHPIKQLQQAERGVSIGKVCANR 81
QY 118 PVANYKKPLLKLYSCNGHFLRLPDCTVGTDRSDPHIQLQLSAESVGEVIKSTGTG 177
Db 82 YLAMKEDGRLLASKCVTDCCFFERLESNNYNYRSKYS--SWYVALARTGOYKLGPKT 139
QY 178 YLAMTDGLGLYSGQTPNECLFLERLEENHYNTYISKKAENKWFVGLKKNKSGCKRGPR 253
Db 140 GPGQKAILFLPMSAKS 155
QY 238 HYQKAILFLPLPVSS 253

RESULT 12
ID FGF2_HUMAN STANDARD; PRT; 155 AA.
AC P09038;
DT 01-NOV-1988 (Rel. 09, Created)
DT 01-NOV-1988 (Rel. 09, Last sequence update)
DT 01-NOV-1997 (Rel. 35, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BEGF) (PROSTATROPIN).
GN FGF2 OR FGFb.
OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 87053817.
RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Friedman J.,
RA Gospodarowicz D., Fiddes J.C.;
RT "Human basic fibroblast growth factor: nucleotide sequence and
RT genomic organization.";
RL EMBO J. 5:2523-2528(1986).
RN [2]
RP SEQUENCE FROM N.A.
RX MEDLINE; 87217066.
RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Fiddes J.C.;
RT "Human basic fibroblast growth factor: nucleotide sequence, genomic
RT organization, and expression in mammalian cells.";
RL Cold Spring Harb. Symp. Quant. Biol. 51:657-668(1986).
RN [3]
RP SEQUENCE FROM N.A.
RX MEDLINE; 87213238.
RA Sommer A., Brewer M.T., Thompson R.C., Moscatelli D., Presta M.,
RA Rifkin D.B.;
RT "A form of human basic fibroblast growth factor with an extended
RT amino terminus.";
RL Biochem. Biophys. Res. Commun. 144:543-550(1987).
RN [4]
RP SEQUENCE FROM N.A.
RX MEDLINE; 87162468.
RA Kurokawa T., Sasada R., Iwane M., Igarashi K.;
RT "Cloning and expression of cDNA encoding human basic fibroblast
RT growth factor.";
RL FEBS Lett. 213:189-194(1987).
RN [5]
RP SEQUENCE FROM N.A.
RX MEDLINE; 89184522.
RA Prats H., Kaghad M., Prats A.C., Klagsbrun M., Lellias J.M.,
RA Liauzun P., Chalou P., Tauber J.P., Amalric F., Smith J.A.,

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RA Caput D.;  
RT "High molecular mass forms of basic fibroblast growth factor are  
RT initiated by alternative CUG codons";  
RL Proc. Natl. Acad. Sci. U.S.A. 86:1836-1840(1989).  
RN [6]  
RP SEQUENCE OF 10-35.  
RX MEDLINE; 86275260.  
RA Gautschi P., Frater-Schroeder M., Boehlen P.;  
RT "Partial molecular characterization of endothelial cell mitogens from  
RT human brain: acidic and basic fibroblast growth factors";  
RL FEBS Lett. 204:203-207(1986).  
RN [7]  
RP SEQUENCE OF 10-39.  
RX MEDLINE; 86186784.  
RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;  
RT "Human brain-derived acidic and basic fibroblast growth factors:  
RT amino terminal sequences and specific mitogenic activities";  
RL Biochem. Biophys. Res. Commun. 135:541-548(1986).  
RN [8]  
RP SEQUENCE OF 2-22.  
RX MEDLINE; 87156686.  
RA Story M.T., Esch F., Shimasaki S., Sasse J., Jacobs S.C., Lawson R.K.;  
RT "Amino-terminal sequence of a large form of basic fibroblast growth  
RT factor isolated from human benign prostatic hyperplastic tissue";  
RL Biochem. Biophys. Res. Commun. 142:702-709(1987).  
RN [9]  
RP X-RAY CRYSTALLOGRAPHY (2.2 ANGSTROMS).  
RX MEDLINE; 91195367.  
RA Eriksson A.E., Cousens L.S., Weaver L.H., Matthews B.W.;  
RT "Three-dimensional structure of human basic fibroblast growth  
RT factor";  
RL Proc. Natl. Acad. Sci. U.S.A. 88:3441-3445(1991).  
RN [10]  
RP X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).  
RX MEDLINE; 94004464.  
RA Eriksson A.E., Cousens L.S., Matthews B.W.;  
RT "Refinement of the structure of human basic fibroblast growth factor  
RT at 1.6-A resolution and analysis of presumed heparin binding sites by  
RT selenate substitution";  
RL Protein Sci. 2:1274-1284(1993).  
RN [11]  
RP X-RAY CRYSTALLOGRAPHY (1.8 ANGSTROMS).  
RX MEDLINE; 91195368.  
RA Zhang J., Cousens L.S., Barr P.J., Sprang S.R.;  
RT "Three-dimensional structure of human basic fibroblast growth factor,  
RT a structural homolog of interleukin 1 beta";  
RL Proc. Natl. Acad. Sci. U.S.A. 88:3446-3451(1991).  
RN [12]  
RP X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).  
RX MEDLINE; 92121151.  
RA Ago H., Kitagawa Y., Fujishima A., Matsuura Y., Katsube Y.;  
RT "Crystal structure of basic fibroblast growth factor at 1.6-A  
RT resolution";  
RL J. Biochem. 110:360-363(1991).  
RN [13]  
RP X-RAY CRYSTALLOGRAPHY (2.8 ANGSTROMS).  
RX MEDLINE; 91095983.  
RA Zhu X., Komlya H., Chirino A., Faham S., Fox G.M., Arakawa T.,  
RT Hsu B.T., Rees D.C.;  
RT "Three-dimensional structures of acidic and basic fibroblast growth  
RT factors";  
RL Science 251:90-93(1991).  
RN [14]  
RP STRUCTURE BY NMR.  
RX MEDLINE; 97040521.  
RA Moy F.J., Seddon A.P., Boehlen P., Powers R.;  
RT "High-resolution solution structure of basic fibroblast growth factor  
RT determined by multidimensional heteronuclear magnetic resonance  
RT spectroscopy";  
RL Biochemistry 35:13552-13561(1996).  
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND

CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -!- SUBUNIT: MONOMER.  
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES  
CC AFGE.  
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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CC -----  
CC EMBL; M17599; AAA52534.1; ALT\_INIT.  
CC EMBL; X04431; CAA38027.1; -.  
CC EMBL; X04432; CAA38028.1; -.  
CC EMBL; X04433; CAA38029.1; -.  
CC EMBL; M27968; AAA52448.1; -.  
CC EMBL; J04513; AAA52533.1; ALT\_INIT.  
CC PIR; A25824; A25824.  
CC PIR; A26642; A26642.  
CC PIR; B24243; B24243.  
CC PIR; B24301; B24301.  
CC PIR; B32878; B32878.  
CC PIR; S00297; S00297.  
CC PDB; 2FGF; 15-APR-92.  
CC PDB; 4FGF; 15-JUL-93.  
CC PDB; 1FGA; 15-JUL-93.  
CC PDB; 1BFB; 03-APR-96.  
CC PDB; 1BFC; 03-APR-96.  
CC PDB; 1BFF; 16-JUN-97.  
CC PDB; 1BFG; 31-JAN-94.  
CC PDB; 2BFH; 30-APR-94.  
CC PDB; 1BLA; 08-NOV-96.  
CC PDB; 1BLD; 08-NOV-96.  
CC PDB; MIM; 134920; -.  
CC PFAM; PF00167; FGF; 1.  
CC PRINTS; PR00262; ILLHGF.  
CC PRINTS; PR00263; HBGF\_FGF.  
CC DR PROSITE; PS00247; HBGF\_FGF; 1.  
CC DR Growth factor; Mitogen; Vascularization; Heparin-binding;  
CC 3D-structure.  
KW PROPEP 1 9  
FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.  
FT SITE 46 48 CELL ATTACHMENT SITE (POTENTIAL).  
FT SITE 88 90 CELL ATTACHMENT SITE (POTENTIAL).  
FT BINDING 27 31 HEPARIN (POTENTIAL).  
FT BINDING 116 119 HEPARIN (POTENTIAL).  
FT STRAND 30 34  
FT TURN 35 38  
FT STRAND 39 43  
FT TURN 45 46  
FT STRAND 49 52  
FT TURN 55 56  
FT HELIX 58 60  
FT STRAND 62 66  
FT TURN 69 70  
FT STRAND 71 76  
FT TURN 77 80  
FT STRAND 81 85  
FT TURN 87 88  
FT STRAND 91 94  
FT HELIX 99 101  
FT STRAND 103 107  
FT TURN 109 110  
FT STRAND 113 117  
FT TURN 121 122  
FT STRAND 124 124  
FT STRAND 127 127  
FT TURN 129 130  
FT STRAND 132 133  
FT HELIX 136 138





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CC EMBL; M22427; AAA41210.1; -  
DR EMBL; X07285; CAA30265.1; -  
DR EMBL; U78079; AAC53225.1; -  
DR EMBL; X61697; CAA43863.1; -  
DR PIR; S00876; S00876.  
DR PIR; A31674; A31674.  
DR HSP; P09038; 1BFF.  
DR PFAM; PF00167; FGF. 1.  
DR PRINTS; PR00262; ILIHGF.  
DR PRINTS; PR00263; HGFHGF.  
DR PROSITE; PS00247; HGFHGF. 1.  
DR Growth factor; Mitogen; Vascularization; Heparin-binding.  
PROPEP 1 9  
CHAIN 10 154 HEPARIN-BINDING GROWTH FACTOR 2.  
BINDING 26 30 HEPARIN (POTENTIAL).  
FT BINDING 115 118 HEPARIN (POTENTIAL).  
SQ SEQUENCE 154 AA; 17139 MW; 1A0F14FF423D8403 CRC64;

Query Match 28.3%; Score 513; DB 1; Length 154;  
Best Local Similarity 54.4%; Pred. No. 6,65e-91;  
Matches 74; Conservative 23; Mismatches 37; Indels 2; Gaps 1;  
Db 21 PGHFKDKPKRYCKNGGFFLRHPDGRVDGVREKSDPHVKLQQAERGVSIRGVCAVR 80  
QY 118 PVANKPKKLYCSNGHFLRLPDGTVDGTRSDQHQIQLQSAESVGEVYIKSTERGQ 177  
Db 81 YLAKEDGRLASKCVTECEFFERLENNYNTYRSKYS--SWYALKRGTQYKLSKT 138  
QY 178 YLAMDGLLYGSGTPNECLFLERLENNYNTYISKHAEKNWFVGLKNGSCKRGPR 237  
Db 139 GPGKAILFLPMSAKS 154  
QY 238 HYGKAILFLPLVSS 253

RESULT 15  
ID SDCA4 MOUSE STANDARD; PRT; 198 AA.  
AC O35988;  
DT 15-FEB-2000 (Rel. 39, Created)  
DI 15-FEB-2000 (Rel. 39, Last sequence update)  
DI 15-FEB-2000 (Rel. 39, Last annotation update)  
SYNDECAN-4 PRECURSOR (RYUDOCAN CORE PROTEIN).  
SDCA4.  
Mus musculus (Mouse).  
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.  
[1]  
SEQUENCE FROM N.A.  
RC STRAIN=C3H/AN, AND 129/SVJ;  
RX MEDLINE: 97420681.  
RA Tsuzuki S., Kojima T., Katsumi A., Yamazaki T., Sugiura I., Saito H.;  
RT Molecular cloning, genomic organization, promoter activity, and  
tissue-specific expression of the mouse ryudocan gene.";  
RL J. Biochem. 122:17-24(1997).  
CC -!- FUNCTION: CELL SURFACE PROTEOGLYCAN THAT BEAR HEPARAN SULFATE.  
CC -!- SUBCELLULAR LOCATION: TYPE I MEMBRANE PROTEIN.  
CC -!- TISSUE SPECIFICITY: UBIQUITOUS.  
CC -!- SIMILARITY: BELONGS TO THE SYNDECAN FAMILY OF INTEGRAL MEMBRANE  
PROTEOGLYCANS.  
CC  
CC This SWISS-PROT entry is copyright. It is produced through a collaboration  
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CC EMBL; D89571; BAA22135.1; -  
DR EMBL; D89572; BAA22136.1; -  
DR MGD; MGI:1349164; SDCA4.  
DR PFAM; PF01034; Syndecin; 1.  
DR PROSITE; PS00964; SYNDECAN; 1.  
KW Proteoglycan; Heparan sulfate; Transmembrane; Glycoprotein; Signal.  
FT SIGNAL 1 23 POTENTIAL.  
FT CHAIN 24 198 SYNDECAN-4.  
FT DOMAIN 24 145 EXTRACELLULAR (POTENTIAL).  
FT TRANSMEM 146 170 POTENTIAL.  
FT DOMAIN 171 198 CYTOPLASMIC (POTENTIAL).  
FT CARBOHYD 44 44 O-LINKED (GLYCOSAMINOGLYCAN) (POTENTIAL).  
FT CARBOHYD 62 62 O-LINKED (GLYCOSAMINOGLYCAN) (POTENTIAL).  
FT CARBOHYD 64 64 O-LINKED (GLYCOSAMINOGLYCAN) (POTENTIAL).  
SQ SEQUENCE 198 AA; 21482 MW; 4246963EC6A25915 CRC64;  
Query Match 27.9%; Score 505; DB 1; Length 198;  
Best Local Similarity 72.4%; Pred. No. 5.48e-89;  
Matches 89; Conservative 13; Mismatches 12; Indels 9; Gaps 6;  
Db 1 MAPACLLAPLLLLLLGGFPLVPGESIRETEVIDPDQLLEGRYFSGALPDDEDA-G-G--S 56  
QY 1 MAPARLEA-LLLFEVGG---VA-ESIRETEVIDPDQLLEGRYFSGALPDDEDAVVGQES 55  
Db 57 DDFELSGGDLDDTEEPPEVIEPLVPLDNHPIENAPQIRVPSEPKLEENEVIPKR 116  
QY 56 DDFELSGGDLDDLEDSMIGFEVHVPLVPLDNHPIERAGSGSQVTEPKKLEENEVIPKR 115  
Db 117 APS 119  
QY 116 ISP 118

Search completed: Tue Aug 29 15:57:12 2000  
Job time : 24 secs.

(TM)

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**Tubular output not generated.**

Description: ~~(1-254)~~ From US09121017B.ppt

sequence: I MAPARLFALLFFVGGVAES.....PRTHYGQKAILFLPLPVSSD 254

Gap 11

Searched: 225878 seqs, 69334122 residues

Listing first 45

Database: sptrembl112

1:sp\_archaea 2:sp\_bacteria 3:sp\_fungi 4:sp\_mammal  
5:sp\_invertebrate 6:sn\_mammal 7:sn\_mhc 8:sn\_orcanelle

Statistics: Mean 45.364; Variance 72.895; scale 0.622

and is derived by analysis of the total score distribution.

1

No.	Score	Match Length	DB	ID	Description	Pred. No.
1	100	10	1	1	1	1
2	95	9	2	2	2	2
3	90	8	3	3	3	3
4	85	7	4	4	4	4
5	80	6	5	5	5	5
6	75	5	6	6	6	6
7	70	4	7	7	7	7
8	65	3	8	8	8	8
9	60	2	9	9	9	9
10	55	1	10	10	10	10

22	223	12.3	204	13	Q90696	FIBROBLAST GROWTH FACT	1.40e-25
----	-----	------	-----	----	--------	------------------------	----------

ID P78443 PRELIMINARY; PRT; 196 AA.

RT expression of basic fibroblast growth factor transcripts in human

DR EMBL; J04513; AAA5

DR EMBL; S47380; AAD1

DR HSSP; P09038; 1BFF

DR PROSTIE; PS00247;  
DR PEAM: PF00167: FCF

DR  
FEB, FEB07, 19  
PRINTS: PR00262: I

DR PRINTS; PR00263; H

SQ	SEQUENCE	196 AA;
----	----------	---------

Quorum: 10 + 1

Query Match  
Best Local Similarity

Matches 74; Conse

Db 63 PPGHFKDPKRLYC

118 PVA NYKKPKT.I.YC

BY OTT FARRINGTON

Db 123 YLAKEDGRLLKSCVTDCEFFERLESNNYTRSKYT--SWYVALKRTGQYKLGSKT 180  
 QY 178 YLAWTDGLLYGSGTNEECFLERLEENHYIISKHAENWVGLAKNGSKRGPR 237  
 Db 181 GPQKAILFLPMSAKS 196  
 QY 238 HYGOKAILFLPLVSS 253

RESULT 2  
 ID Q77767 PRELIMINARY; PRT; 130 AA.  
 AC Q77767;  
 DT 01-NOV-1998 (TREMELrel. 08, Created)  
 DT 01-NOV-1998 (TREMELrel. 08, Last sequence update)  
 DT 01-NOV-1999 (TREMELrel. 12, Last annotation update)  
 DE BASIC FIBROBLAST GROWTH FACTOR (FRAGMENT).  
 GN BFGF.  
 OS Canis familiaris (Dog).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
 OE Eutheria; Carnivora; Fissipedia; Canidae; Canis.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RC TISSUE-ADRENAL GLAND;  
 RA TROCHTA O.A., JACOBS R.M., LAMARRE J.;  
 RT "The role of bFGF in canine Hemangiosarcoma";  
 RL Submitted (APR-1998) to the EMBL/GenBank/DBJ databases.  
 DR EMBL; AF060562; AAC35912.1;  
 DR HSSP; P09038; 1BFF.  
 DR PROSITE; PS00247; HBGF\_FGF; 1.  
 DR PFAM; PF00167; FGF; 1.  
 FT NON\_TER 1  
 FT NON\_TER 130 130  
 SQ SEQUENCE 130 AA; 14902 MW; DB6A90A4 CRC32;

Query Match 28.2%; Score 511; DB 6; Length 130;  
 Best Local Similarity 55.3%; Pred. No. 1.14e-93;  
 Matches 73; Conservative 21; Mismatches 36; Indels 2; Gaps 1;  
 Db 1 FKDPKLYCKNGGFFRIHPDGVGVREKSDPHVQLQQAERGVSIVKGCANRYLAM 60  
 QY 122 YKPKLLYCSNGGHFLRLPDGVGTRDRSDQHIQLLSAESVGEVYIKSTETGOYLAM 181  
 Db 61 KEDGRLLKSCVTDCEFFERLESNNYTRSKYS--SWYVALKRTGQYKLGPKTPGQ 118  
 QY 182 DTGLYGSQTPNEECFLERLEENHYIISKHAENWVGLKNGSKRGPRTHYGO 241  
 Db 119 KAILFLPMSAKS 130  
 QY 242 KAILFLPLVSS 253

RESULT 3  
 ID Q35988 PRELIMINARY; PRT; 198 AA.  
 AC Q35988;  
 DT 01-JAN-1998 (TREMELrel. 05, Created)  
 DT 01-JAN-1998 (TREMELrel. 05, Last sequence update)  
 DT 01-NOV-1999 (TREMELrel. 12, Last annotation update)  
 DE RYUDOCAN CORE PROTEIN PRECURSOR.  
 OS Mus musculus (Mouse).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
 OE Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RC STRAIN-C3H/AN, AND 129SVJ;  
 RX MEDLINE; 97420681.  
 RA TSUZUKI S., KOJIMA T., KATSUMI A., YAMAZAKI T., SUGIURA I., SAITO H.;  
 RT "Molecular cloning, genomic organization, promoter activity, and  
 tissue-specific expression of the mouse ryudocan gene";  
 RL J. Biochem. 122:117-24(1997).  
 CC -!- FUNCTION: CELL SURFACE PROTEOGLYCAN THAT BEARS BOTH HEPARAN  
 CC SULFATE AND CHONDROITIN SULFATE AND THAT LINKS THE CYTOSKELETON TO  
 CC THE INTERSTITIAL MATRIX. BINDS BASIC FIBROBLAST GROWTH FACTOR.

DR EMBL; D89571; BAA22135.1; -  
 DR EMBL; D89572; BAA22136.1; -  
 DR PROSITE; PS00964; SYNDECAN; 1.  
 DR PFAM; PF01034; Syndecan; 1.  
 KW Signal; Proteoglycan; Heparan sulfate; Transmembrane; Glycoprotein.  
 FT SIGNAL 1 23 POTENTIAL.  
 FT CHAIN 24 198 POTENTIAL.  
 SQ SEQUENCE 198 AA; 21482 MW; FC67B0E5 CRC32;

Query Match 27.9%; Score 505; DB 11; Length 198;  
 Best Local Similarity 72.4%; Pred. No. 3.47e-92;  
 Matches 89; Conservative 13; Mismatches 12; Indels 9; Gaps 6;  
 Db 1 MAPACLLAPLLLLLGGFPLVPGESIRETEVIDPDQLLEGRYFSGALPDDEDA-G-G--S 56  
 QY 1 MAPARLEA-LLLFFVGG---VA-ESIRETEVIDPDQLLEGRYFSGALPDDEVDVGGQES 55  
 Db 57 DDFELSGSGDLDDTEPRPFPEVIEPLVDNHNIPENQAPGIRVPSEPKLENEVIPKR 116  
 QY 56 DDFELSGSGDLDDLEDSMIGPEVHVPLVDNHNIPERAGSGSQVTEPKLENEVIPKR 115  
 Db 117 APS 119  
 QY 116 ISP 118

RESULT 4  
 ID P79706 PRELIMINARY; PRT; 101 AA.  
 AC P79706;  
 DT 01-MAY-1997 (TREMELrel. 03, Created)  
 DT 01-MAY-1997 (TREMELrel. 03, Last sequence update)  
 DT 01-NOV-1999 (TREMELrel. 12, Last annotation update)  
 DE BASIC FGF (FRAGMENT).  
 OS Cynops pyrrhogaster (Japanese common newt).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Amphibia;  
 OE Batrachia; Caudata; Salamandroidae; Salamandridae; Cynops.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RC TISSUE-EMBRYO;  
 RA SUZUKI A.S., TABATA T., SAKAGUCHI K., TAKABATAKE T., TAKESHIMA K.,  
 RA KANEDA T.;  
 RT "Serial expression of the genes in a mesodermatizing ectoderms of  
 early Cynops gastrula";  
 RL Submitted (NOV-1996) to the EMBL/GenBank/DBJ databases.  
 DR EMBL; D89443; BAA13958.1; -  
 DR HSSP; P09038; 2BFH.  
 DR PROSITE; PS00247; HBGF\_FGF; 1.  
 DR PFAM; PF00167; FGF; 1.  
 FT NON\_TER 1  
 FT NON\_TER 101 101  
 SQ SEQUENCE 101 AA; 11907 MW; 1CD93BB0 CRC32;

Query Match 21.1%; Score 382; DB 13; Length 101;  
 Best Local Similarity 53.4%; Pred. No. 3.14e-62;  
 Matches 55; Conservative 18; Mismatches 28; Indels 2; Gaps 1;  
 Db 1 PRLCYCKNGGFLRLNSDKVDGAREKSDSYIKLQQAERGVSIVKGCANRYLAMKDD 60  
 QY 125 PRLLYCSNGGHFLRLPDGVGTRDRSDQHIQLLSAESVGEVYIKSTETGOYLAMTD 184  
 Db 61 GRIMALKWTDDCEFFERLESNNYTRSKYS--WYVALKR 101  
 QY 185 GLLYGSQTPNEECFLERLEENHYIISKHAENWVGLAK 227

RESULT 5  
 ID Q07659 PRELIMINARY; PRT; 146 AA.  
 AC Q07659;  
 DT 01-NOV-1996 (TREMELrel. 01, Created)  
 DT 01-NOV-1996 (TREMELrel. 01, Last sequence update)  
 DT 01-NOV-1999 (TREMELrel. 12, Last annotation update)  
 DE FIBROBLAST GROWTH FACTOR.  
 GN BFGF.

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OS Gallus gallus (Chicken).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;
OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 93246053.
RA BORJA A.Z., ZELLER R., MEIJERS C.;
RT "Expression of alternatively spliced bFGF first coding exons and
RT antisense mRNAs during chicken embryogenesis.";
RL Dev. Biol. 157:110-118(1993).
RN [2]
RP SEQUENCE OF 52-85 FROM N.A.
RX MEDLINE; 90382254.
RA MITRANI E., GRUENBAUM Y., SHOHAT H., ZIV T.;
RT "Fibroblast growth factor during mesoderm induction in the early chick
RT embryo.";
RL Development 109:387-393(1990).
DR EMBL; M95706; AAA48616.1; -.
DR EMBL; X56804; CAA40139.1; -.
DR HSSP; P09038; 2BFH.
DR PROSITE; PS00247; HBGF_FGF; 1.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00262; ILIHBGF.
DR SEQUENCE 146 AA; 16182 MW; 44C5274B CRC32;

Query Match 19.1%; Score 346; DB 13; Length 146;
Best Local Similarity 48.1%; Pred. No. 1.15e-53;
Matches 50; Conservative 20; Mismatches 32; Indels 2; Gaps 1;

Db 45 ERYSAVMKIQQAERGVSIVKGSANRFLANKEDGRLLAKCATCECFERLESNNYN 104
QY 150 DRSDQHIQLQSAESVGEVIKSTETGYQLAMDTDGLLYGTSPTNECLFLERLEENHYN 209

Db 105 TVRSKRYSD--WYVALKRTGQVKGPKTGPQKAILFLPSAKS 146
QY 210 TVYSKHAENKFWVLKNGSKRGKRPRTGYQKAILFLPLVSS 253

RESULT 6
ID Q60487 PRELIMINARY; PRT; 115 AA.
AC Q60487;
DT 01-NOV-1996 (TRENBLrel. 01, Created)
DT 01-NOV-1996 (TRENBLrel. 01, Last sequence update)
DE BASIC FIBROBLAST GROWTH FACTOR (FRAGMENT).
OS Cavia porcellus (Guinea pig).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Rodentia; Hystricognathi; Caviidae; Cavia.
RN [1]
RP SEQUENCE FROM N.A.
RX TISSUE=PROSTATE;
RA RICCIARDELLI C.;
RL Submitted (JAN-1996) to the EMBL/GenBank/DBJ databases.
DR EMBL; L75974; AAA85394.1; -.
DR HSSP; P09038; 2BFH.
DR PROSITE; PS00247; HBGF_FGF; 1.
DR PFAM; PF00167; FGF; 1.
DR NON_TER 1
FT SEQUENCE 115 AA; 13495 MW; 4B12914A CRC32;

Query Match 17.3%; Score 313; DB 11; Length 115;
Best Local Similarity 44.6%; Pred. No. 6.33e-46;
Matches 45; Conservative 22; Mismatches 31; Indels 3; Gaps 2;

Db 1 GFFLRTHPGRDVGREKTDPHKHNKPKA-EELCYQGSLSNRYLAMKEDGRLLASKCV 59
QY 134 GHFLRLPDGTVGTRDRSDQHIQLQSAESVGEVIKSTETGYQLAMDTDGLLYGSQTP 193

Db 60 TDCFFERLESNNYTYRSKYS--SWYVALKRTQYKLG 98
QY 194 NEECFLERLEENHYNITYISKHAENKFWVLKNGSKRG 234

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RESULT 7
ID P79150 PRELIMINARY; PRT; 194 AA.
AC P79150;
DT 01-MAY-1997 (TRENBLrel. 03, Created)
DT 01-MAY-1997 (TRENBLrel. 03, Last sequence update)
DT 01-NOV-1999 (TRENBLrel. 12, Last annotation update)
DE KERATINOCYTE GROWTH FACTOR.
OS Canis familiaris (Dog).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Carnivora; Fissipedia; Canidae; Canis.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 96226403.
RA CANATAN H., CHANG W.Y., SUGIMOTO Y., SHIDAIFAT F., KULP S.K.,
RA BRUEGGEMEIER R.W., LIN Y.C.;
RT "Keratinocyte growth factor (KGF/FGF-7) has a paracrine role in canine
RT prostate: molecular cloning of mRNA encoding canine KGF.";
RL DNA Cell Biol. 15:247-254(1996).
DR EMBL; U08000; AAB38972.1; -.
DR HSSP; P05230; 2AFG.
DR PROSITE; PS00247; HBGF_FGF; 1.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00262; ILIHBGF.
DR PRINTS; PR00263; HBGF_FGF.
DR SEQUENCE 194 AA; 22476 MW; 2B71A8ED CRC32;

Query Match 16.6%; Score 301; DB 6; Length 194;
Best Local Similarity 38.6%; Pred. No. 3.85e-43;
Matches 49; Conservative 28; Mismatches 47; Indels 3; Gaps 3;

Db 69 LFCRTQ-WYLRIDKRGKVGKTOEMKSNYIMEIRVAVGIVAKGVESEYLLAMNKEGKL 127
QY 128 LYCSNGGHELRILPDGTVGTRDRSDQHIQLQSAESVGEVIKSTETGYQLAMDTDGLL 187

Db 128 YAKKECNDENKLEILNHNHYTASAKWTHSGGEMFVALNOKGVVPVKKTKKQKTAH 187
QY 188 YGSQTPNEECLFLERLEENHYNITYIS-K-KHAENKFWVLKNGSKRGKRPRTGYQKAIL 245

Db 188 FLPMAT 194
QY 246 FLPLPVS 252

RESULT 8
ID Q42407 PRELIMINARY; PRT; 212 AA.
AC Q42407;
DT 01-JAN-1998 (TRENBLrel. 05, Created)
DT 01-JUN-1998 (TRENBLrel. 06, Last sequence update)
DT 01-NOV-1999 (TRENBLrel. 12, Last annotation update)
DE FIBROBLAST GROWTH FACTOR 10.
OS Gallus gallus (Chicken).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;
OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 97330690.
RA OHUCHI H., NAKAGAWA T., YAMAMOTO A., ARAGA A., OHTA T., ISHIWARU Y.,
RA YOSHIOKA H., KUWANA T., NOHNO T., YAMASAKI M., ITOH N., NOJI S.;
RT "The mesenchymal factor, FGF10, initiates and maintains the outgrowth
RT of the chick limb bud through interaction with FGF8, an apical
RT ectodermal factor.";
RL Development 124:2235-2244(1997).
DR EMBL; D86333; BAA24945.1; -.
DR HSSP; P03968; IBAR.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00263; HBGF_FGF.
DR SEQUENCE 212 AA; 23631 MW; C8AB1883 CRC32;

Query Match 15.9%; Score 289; DB 13; Length 212;
Best Local Similarity 39.1%; Pred. No. 2.24e-40;
Matches 52; Conservative 26; Mismatches 51; Indels 4; Gaps 4;

Db 82 RKRKL-Y-SYNYFLKIEKNGKVSCTKENCPSFLEITSVEIGVAVKSIKSNYYLAWN 139

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DR PFAM; PF00167; FGF; 1.  
FT NON\_TER 59  
SQ SEQUENCE 59 AA; 6595 MW; 1C932B1D CRC32;

Query Match 14.8%; Score 269; DB 4; Length 59;  
Best Local Similarity 94.7%; Pred. No. 8.19e-36;  
Matches 36; Conservative 1; Mismatches 1; Indels 0; Gaps 0;

Db 19 PPGNTKKPKLLYCSNGHFLRLIPDGTVDGTRDRSDQH 56  
Qy 118 PVANYKKPKLLYCSNGHFLRLIPDGTVDGTRDRSDQH 155

RESULT 13

ID Q9YH31 PRELIMINARY; PRT; 196 AA.

AC Q9YH31;  
DT 01-MAY-1999 (TReMBLrel. 10, Created)  
DT 01-MAY-1999 (TReMBLrel. 10, Last sequence update)  
DT 01-NOV-1999 (TReMBLrel. 12, Last annotation update)  
PUTATIVE FIBROBLAST GROWTH FACTOR-4.

Notophthalmus viridescens (Eastern newt) (Triturus viridescens).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Amphibia;  
OC Batrachia; Caudata; Salamandroides; Salamandridae; Notophthalmus.  
RN [1]  
RP SEQUENCE FROM N.A.

RA WEI Y.;  
RT "Putative Newt Fibroblast Growth Factor-4";  
RL Submitted (OCF-1996) to the EMBL/GenBank/DBJ databases.  
DR EMBL; U76998; AAC98812.1;

DR HSSP; P09038; 1BFF.

DR PROSITE; PS00247; HBG\_FGF; 1.

SQ SEQUENCE 196 AA; 22033 MW; 455E08A3 CRC32;

Query Match 14.3%; Score 260; DB 13; Length 196;  
Best Local Similarity 34.6%; Pred. No. 8.83e-34;  
Matches 44; Conservative 31; Mismatches 48; Indels 4; Gaps 3;

Db 71 KRLRLYCNVGFHQLVLPDGRIRGHMS- RYSLLEISPVYRGVYQSGILFLAM 129  
Qy 123 KPKLLYCSNGGHF-LRLIPDGTVDGTRDRSDQHQLQLSAESVGEYIKSTETGQYLAM 181

Db 130 NSKGRLEFGSKYSDECKFKEMLLPNYNAYESWRYPGM--YIALSKNGRAKNGKVSPTM 187  
Qy 182 DTGGLYGSQTNEECFLERLEENHYNTYISKHAEKNWVGLAKNGSKRGPRTHYQ 241

Db 188 TWHELP 194

242 KAILFLP 248

RESULT 14

ID Q9W6A1 PRELIMINARY; PRT; 243 AA.

AC Q9W6A1;  
DT 01-NOV-1999 (TReMBLrel. 12, Created)  
DT 01-NOV-1999 (TReMBLrel. 12, Last sequence update)  
DT 01-NOV-1999 (TReMBLrel. 12, Last annotation update)  
DE FIBROBLAST GROWTH FACTOR 12 ISOFORM A.

GN FGF12.

OS Gallus gallus (Chicken).

OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;  
OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.  
RN [1]  
RP SEQUENCE FROM N.A.

RX MEDLINE; 99065510.

RA MUNOZ-SANJUAN I.; SIMANDL B.K.; FALLON J.F.; NATHANS J.;

RT "Expression of chicken fibroblast growth factor homologous factor  
(FHF)-1 and of differentially spliced isoforms of FHF-2 during  
development and involvement of FHF-2 in chicken limb development.";

RL Development 126:409-421(1999).

DR EMBL; AF108754; AAD21575.1;

DR PROSITE; PS00247; HBG\_FGF; 1.

SQ SEQUENCE 243 AA; 27455 MW; A9E5E8CD CRC32;

Query Match 14.2%; Score 257; DB 13; Length 243;  
Best Local Similarity 34.4%; Pred. No. 4.17e-33;  
Matches 44; Conservative 31; Mismatches 48; Indels 5; Gaps 3;

Db 77 LF-SQOYFLOHHPDGTIDGTDKDNSDYTLFNLPVGLRVVAIOGVKASLYVAMNGEYL 135  
Qy 128 LYCSNGGHFLRLIPDGTVDGTRDRSDQHQLQLSAESVGEYIKSTETGQYLAMDTDGLL 187

Db 136 YSSDVFTECKFKESVFNYYVYSSSTLYROESGRAWFLGNKEGOIMKGNRVKKTTPS 195  
Qy 188 YGSQTPNEECFLERLEENHYNTYISK--KHAEE--KNWFVGLKNGSKRGPRTHYGOKA 243

Db 196 SHFVKPI 203

Qy 244 ILFLPLP 251

RESULT 15

ID Q99517 PRELIMINARY; PRT; 127 AA.

AC Q99517;  
DT 01-MAY-1997 (TReMBLrel. 03, Created)  
DT 01-MAY-1997 (TReMBLrel. 03, Last sequence update)  
DT 01-NOV-1999 (TReMBLrel. 12, Last annotation update)  
DE FIBROBLAST GROWTH FACTOR 12 (FRAGMENT).

GN FGF12.

OS Homo sapiens (Human).

OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;

OC Eutheria; Primates; Catarrhini; Homnidae; Homo.

RN [1]

RP SEQUENCE FROM N.A.

RA COULIER F.; PONTAROTTI P.; ROUBIN R.; HARTUNG H.; GOLDFARB M.;

RA BIRNBAUM D.;

RL J. Mol. Evol. 0:0-0(0).

DR EMBL; Z70276; CAA94240.1;

DR HSSP; P03968; IAF.

DR PROSITE; PS00247; HBG\_FGF; 1.

DR PFAM; PF00167; FGF; 1.

FT NON\_TER 1 127

SQ SEQUENCE 127 AA; 14478 MW; 10E2842D CRC32;

Query Match 13.8%; Score 251; DB 4; Length 127;

Best Local Similarity 34.6%; Pred. No. 9.22e-32;

Matches 44; Conservative 30; Mismatches 48; Indels 5; Gaps 3;

Db 2 LF-SQOYFLOHHPDGTIDGTDKDNSDYTLFNLPVGLRVVAIOGVKASLYVAMNGEYL 60  
Qy 128 LYCSNGGHFLRLIPDGTVDGTRDRSDQHQLQLSAESVGEYIKSTETGQYLAMDTDGLL 187

Db 61 YSSDVFTECKFKESVFNYYVYSSSTLYROESGRAWFLGNKEGOIMKGNRVKKTTPS 120  
Qy 188 YGSQTPNEECFLERLEENHYNTYISK--KHAEE--KNWFVGLKNGSKRGPRTHYGOKA 243

Db 121 SHFVKPI 127

Qy 244 ILFLPLP 250

Search completed: Tue Aug 29 15:58:33 2000  
Job time : 64 secs.



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18  
17



(TM)

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MPsrch_pp  protein - protein database search, using Smith-Waterman algorithm
on:         Tue Aug 29 16:06:12 2000;  MasPar time 9.50 Seconds
          700.535 Million cell updates/sec
Tabular output not generated.

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Scoring table: PAM 150  
Gap 11

Post-processing: Minimum Match 0%  
Listing first 45 summaries

Statistics: Mean 33.230; Variance 150.315; scale 0.221

## SUMMARIES

Sult No.	Query		Length	DB	ID	Description	Pred. No.
	Score	Match					
1	984	49.7	140		R25914	Human acidic fibroblas	3.21e-78
2	984	49.7	140		R34497	Human acidic fibroblas	3.21e-78
3	984	49.7	140		P90068	Human acid fibroblast	3.21e-78
4	984	49.7	140		R74647	Human recombinant afGF	3.21e-78
5	984	49.7	140		W04806	Human acidic fibroblas	3.21e-78
6	984	49.7	140		P70995	Sequence of human prot	3.21e-78
7	984	49.7	141		R10527	Human acidic fibroblas	3.21e-78
8	984	49.7	151		R05789	Human afGF encoded by	3.21e-78
9	984	49.7	154		W92283	Human beta-endothelial	3.21e-78
10	984	49.7	154		W04805	Human beta-endothelial	3.21e-78
11	984	49.7	154		W06816	Human endothelial cell	3.21e-78
12	984	49.7	154		W75414	Human beta-endothelial	3.21e-78
13	984	49.7	155		P94037	Human acidic fibroblas	3.21e-78
14	984	49.7	155		R70812	FGF-1.	3.21e-78
15	984	49.7	155		P70482	Sequence encoded by co	3.21e-78
16	984	49.7	155		R80776	Fibroblast growth fact	3.21e-78
17	984	49.7	155		W53022	Fibroblast growth fact	3.21e-78
18	984	49.7	155		W75711	Fibroblast growth fact	3.21e-78
19	984	49.7	155		W75415	Human endothelial cell	3.21e-78
20	984	49.7	155		W92291	Human endothelial cell	3.21e-78
21	984	49.7	165		R05785	Human bGCG encoded by	3.21e-78
22	984	49.7	168		W06818	Human endothelial cell	3.21e-78
23	983	49.6	134		W75413	Human alpha-endothelia	3.98e-78

QY 267 GOKAILFLPLPVSSD 281

RESULT 2

ID R34497 standard; protein; 140 AA.

AC R34497;

DE 06-AUG-1993 (first entry)

DE Human acidic fibroblast growth factor.

KW aFGF; mutin; glycosylation site; glycoprotein.

OS Homo sapiens.

PN J05076356-A.

PD 30-MAR-1993.

PF 30-MAY-1991; 127435.

PR 31-MAY-1990; JP-143388.

PA (TAKE ) TAKEDA CHEM IND LTD.

DR WPI; 93-139564/17.

PT FGF mutin prep. useful for therapy of burn or thrombosis - by transformation of lymphocyte-contained animal cell by vector contg. DNA encoding FGF mutin

BT Disclosure; Page 3; 23pp; Japanese.

CC The invention covers mutants of FGF (esp. bFGF) which contain at least one glycosylation site. The mutants can be used to treat burns and thrombosis.

SQ Sequence 140 AA;

Query Match 49.7%; Score 984; DB 1; Length 140;

Best Local Similarity 99.3%; Pred. No. 3.21e-78;

Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 65

QY 147 ANYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 206

Db 66 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 125

QY 207 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 266

Db 126 GOKAILFLPLPVSSD 140

QY 267 GOKAILFLPLPVSSD 281

RESULT 3

ID P90068 standard; protein; 140 AA.

AC P90068;

DE 1-NOV-1989 (first entry)

DE Human acid fibroblast growth factor

KW Human acidic fibroblast growth factor; mutant.

OS Homo sapiens

PN EP-319052-A.

PD 14-JUN-1989.

PF 14-OCT-1988; 202306.

PR 22-OCT-1987; EP-244431.

PA (MERI) Merck and Co.

PI Thomas Jnr KA, Linemeyer DL;

DR WPI; 89-167092/23.

PT Mutant acidic fibroblast growth factor

PT - used for promoting repair of soft tissue, musculoskeletal tissue or vascular or nerve tissue and plasminogen activator prodn.

PS Disclosure; page 4; 36pp; English.

CC Amino acid sequence of human acidic fibroblast growth factor (aFGF). The patent claims mutant forms which have increased biological activity with(out) heparin, and promote cell growth.

SQ Sequence 140 AA;

Query Match 49.7%; Score 984; DB 1; Length 140;

Best Local Similarity 99.3%; Pred. No. 3.21e-78;

Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 65

QY 147 ANYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 206

Db 66 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 125

QY 207 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 266

Db 126 GOKAILFLPLPVSSD 140

QY 267 GOKAILFLPLPVSSD 281

RESULT 4

ID R74647 standard; protein; 140 AA.

AC R74647;

DE 25-SEP-1995 (first entry)

DE Human recombinant aFGF.

KW Acidic fibroblast growth factor; aFGF; vulnary; angiogenesis; mitogen.

OS Homo sapiens.

PN US5401832-A.

PD 28-MAR-1995.

PF 24-DEC-1984; US-685923.

PR 24-DEC-1984; US-685923.

PR 12-SEP-1985; US-774359.

PR 30-MAY-1986; US-868473.

PR 11-JUL-1986; US-884460.

PR 04-JUN-1987; US-054991.

PR 04-MAY-1988; US-190293.

PR 08-FEB-1991; US-765472.

PR 25-SEP-1991; US-765472.

PR 25-SEP-1992; US-951365.

PA (MERI) MERCK & CO INC.

PI Gimenez-Gallego G, Kelly LJ, Linemeyer DL, Thomas KA;

DR WPI; 93-138983/18.

PT New recombinant human acidic fibroblast growth factor - used to promote cell growth, to promote wound healing, for vascular grafts and blood vessel repair

PT Claim 2; Column 30; 25pp; English.

CC Oligonucleotides were synthesized on the basis of the amino acid sequence of bovine acidic fibroblast growth factor (aFGF) and used to produce a synthetic gene (given in Q88233) incorporating codons preferred by E. coli or mammalian cells, unique cloning sites, etc. This synthetic gene was mutagenized to obtain a gene encoding a human recombinant aFGF (R74647) having activity equivalent to the native protein.

SQ Sequence 140 AA;

Query Match 49.7%; Score 984; DB 1; Length 140;

Best Local Similarity 99.3%; Pred. No. 3.21e-78;

Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 65

QY 147 ANYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 206

Db 66 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 125

QY 207 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 266

Db 126 GOKAILFLPLPVSSD 140

QY 267 GOKAILFLPLPVSSD 281

RESULT 5

ID W04806 standard; protein; 140 AA.

AC W04806;

DE 29-DEC-1996 (first entry)

DE Human acidic fibroblast growth factor.

KW Endothelial cell growth factor; ECGF; blood vessel; regeneration; heparin-Sepharose affinity chromatography; probe; oligonucleotide; FGF; fibroblast growth factor; ss.

OS Homo sapiens.

PN US552528-A.  
 PD 03-SEP-1996.  
 PF 03-MAR-1986; 835594.  
 PR 03-MAR-1986; US-835594.  
 PR 18-DEC-1987; US-134499.  
 PR 29-APR-1991; US-693079.  
 PR 27-NOV-1991; US-799859.  
 PR 03-NOV-1994; US-334884.  
 PR (RHON ) RHONE POULENC RORER PHARM INC.  
 PI Burgess W, Maciag T;  
 DR WPI: 96-412132/41.  
 DR N-PSDB: T37503.  
 PT Isolated, purified, biologically active bovine beta endothelial cell  
 PT growth factor - useful to regenerate or treat damaged blood vessels  
 PS Disclosure; Fig 8; 28pp; English.  
 CC Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having  
 CC a mol.wt. of 20 kD can be purified at least 16300 fold from bovine  
 CC brain using heparin-Sepharose affinity chromatography. ECGF is  
 CC useful for, among other purposes, diagnostic applications and has  
 CC potential in the treatment of damaged blood vessels or other  
 CC endothelial cell-lined structures.  
 CC Human ECGF (T37503) or fragments may be obtained using  
 CC oligonucleotides (T37504 and T37509) whose design is based  
 CC on the sequence of bovine alpha- and beta-ECGF.  
 SQ Sequence 140 AA;

Query Match 49.7%; Score 984; DB 1; Length 140;  
 Best Local Similarity 99.3%; Pred. No. 3.21e-78;  
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 65  
 QY 147 ANYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 206  
 :|||||

Db 66 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKHAENFVGLKNGSKCRGPRTHY 125  
 QY 207 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKHAENFVGLKNGSKCRGPRTHY 266  
 :|||||

Db 126 GOKAILFLPLPVSSD 140  
 QY 267 GOKAILFLPLPVSSD 281  
 :|||||

RESULT 6  
 ID P70995 standard; protein; 140 AA.  
 AC P70995.  
 DB 13-JUN-1991 (first entry)  
 PT Sequence of human proteinaceous factor (PFI) with mitogenic activity.  
 PT Cell growth promoter; mitogen; vascularisation; wound healing.  
 PT Homo sapiens.  
 FH Key Location/Qualifiers  
 FT misc\_difference 140  
 FT /label= Asp-OH  
 PN EP-241136-A.  
 PD 14-OCT-1987.  
 PF 06-MAR-1987; 301969.  
 PR 07-MAR-1986; US-838096.  
 PR (HARD ) HARVARD COLLEGE.  
 PI Lobb RR, Harper JW, Strydom DJ;  
 DR WPI: 87-28595/41.  
 PT Mitogenic polypeptide isolated from human brain tissue - useful  
 PT for increasing vascular effect in eg wound healing, or  
 PT generating endothelial cell linings for vascular prostheses, etc.  
 PS Claim 3; Page 1; 31pp; English.  
 CC The PF of the invention was obtd. from human brain tissue. It has a  
 CC mol. wt. of 15,200-16,500 (pref. 15,616-16,056) and has a high  
 CC affinity for heparin. PFI and fragments are useful for promoting the  
 CC growth of mesoderm-derived cells or neuroectoderm-derived cells and  
 CC generating endothelial cell linings for vascular prostheses (all  
 CC claimed). The polypeptides are useful for increasing vascularisation.  
 SQ Sequence 140 AA;

Query Match 49.7%; Score 984; DB 1; Length 140;  
 Best Local Similarity 99.3%; Pred. No. 3.21e-78;  
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 65  
 QY 147 ANYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 206  
 :|||||

Db 66 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKHAENFVGLKNGSKCRGPRTHY 125  
 QY 207 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKHAENFVGLKNGSKCRGPRTHY 266  
 :|||||

Db 126 GOKAILFLPLPVSSD 140  
 QY 267 GOKAILFLPLPVSSD 281  
 :|||||

RESULT 6  
 ID P70995 standard; protein; 140 AA.  
 AC P70995.  
 DB 13-JUN-1991 (first entry)  
 PT Sequence of human proteinaceous factor (PFI) with mitogenic activity.  
 PT Cell growth promoter; mitogen; vascularisation; wound healing.  
 PT Homo sapiens.  
 FH Key Location/Qualifiers  
 FT misc\_difference 140  
 FT /label= Asp-OH  
 PN EP-241136-A.  
 PD 14-OCT-1987.  
 PF 06-MAR-1987; 301969.  
 PR 07-MAR-1986; US-838096.  
 PR (HARD ) HARVARD COLLEGE.  
 PI Lobb RR, Harper JW, Strydom DJ;  
 DR WPI: 87-28595/41.  
 PT Mitogenic polypeptide isolated from human brain tissue - useful  
 PT for increasing vascular effect in eg wound healing, or  
 PT generating endothelial cell linings for vascular prostheses, etc.  
 PS Claim 3; Page 1; 31pp; English.  
 CC The PF of the invention was obtd. from human brain tissue. It has a  
 CC mol. wt. of 15,200-16,500 (pref. 15,616-16,056) and has a high  
 CC affinity for heparin. PFI and fragments are useful for promoting the  
 CC growth of mesoderm-derived cells or neuroectoderm-derived cells and  
 CC generating endothelial cell linings for vascular prostheses (all  
 CC claimed). The polypeptides are useful for increasing vascularisation.  
 SQ Sequence 140 AA;

Query Match 49.7%; Score 984; DB 1; Length 140;  
 Best Local Similarity 99.3%; Pred. No. 3.21e-78;  
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Best Local Similarity 99.3%; Pred. No. 3.21e-78;  
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 65  
 QY 147 ANYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 206  
 :|||||

Db 66 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKHAENFVGLKNGSKCRGPRTHY 125  
 QY 207 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKHAENFVGLKNGSKCRGPRTHY 266  
 :|||||

Db 126 GOKAILFLPLPVSSD 140  
 QY 267 GOKAILFLPLPVSSD 281  
 :|||||

RESULT 7  
 ID R10527 standard; Protein; 141 AA.  
 AC R10527;  
 DT 15-APR-1991 (first entry)  
 DE Human acidic fibroblast growth factor gene.  
 KW aFGF; antibody; antigen; cancer; ss.  
 OS Homo sapiens.  
 FH Key Location/Qualifiers  
 FT region 2..12  
 FT /label= A  
 FT region 56..67  
 FT /label= B  
 FT region 104..114  
 FT /label= C  
 FT region 132..141  
 FT /label= D  
 PN J02306996-A.  
 PD 20-DEC-1990.  
 PF 03-JUL-1989; 172542.  
 PR 04-JUL-1988; JP-166275.  
 PR 03-JUL-1989; JP-172542.  
 PA (TAKE ) TAKEDA CHEMICAL IND KK.  
 DR WPI: 91-040150/06.  
 DR N-PSDB: Q10399.  
 PT Anti-acid antibody, for cancer diagnosis, etc. - is obtd. by  
 PT using complex of partial peptide(s) of acid fibroblast growth  
 PT factor and protein as antigen.  
 PS Disclosure; Fig 1; 19pp; Japanese.  
 CC The was deduced from a gene used to produce recombinant aFGF.  
 CC Peptides derived from the protein, esp. from A-D can be used to as  
 CC antigens to produce anti-aFGF antibodies. The peptides must  
 CC comprise 8-10 continuous AAs from A or B (claims 5 and 6 resp.),  
 CC 7-10 continuous AAs from C (claim 7), or 8-9 continuous AAs from D  
 CC (claim 8). The Abs can be used for immunochemically measuring aFGF,  
 CC and for purifying aFGF. They are useful as reagents in the diag-  
 CC nosis of various cancers or diseases of the CNS. Purified aFGF  
 CC has wound healing and nerve cell proliferating properties.  
 SQ Sequence 141 AA;

Query Match 49.7%; Score 984; DB 1; Length 141;  
 Best Local Similarity 99.3%; Pred. No. 3.21e-78;  
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 7 GNYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 66  
 QY 147 ANYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 206  
 :|||||

Db 67 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKHAENFVGLKNGSKCRGPRTHY 126  
 QY 207 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKHAENFVGLKNGSKCRGPRTHY 266  
 :|||||

Db 127 GOKAILFLPLPVSSD 141  
 QY 267 GOKAILFLPLPVSSD 281  
 :|||||

RESULT 8



QY 147 ANYKKPILYCSNGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGOYL 206  
 Db 80 AMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 139  
 :|||||  
 QY 207 AMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 266  
 :|||||  
 Db 140 GQKAILFLPLPVSSD 154  
 :|||||  
 QY 267 GQKAILFLPLPVSSD 281  
 :|||||

RESULT 11  
 ID W06816 standard; Protein; 154 AA.  
 AC W06816;  
 DT 17-MAR-1997 (first entry)  
 DE Human endothelial cell growth factor-beta.  
 KW Endothelial cell growth factor-beta; ECGF-beta.  
 OS Homo sapiens.  
 US5571790-A.  
 05-NOV-1996.  
 03-MAR-1986; 835594.  
 03-MAR-1986; US-835594.  
 18-DEC-1987; US-134499.  
 29-APR-1991; US-693079.  
 27-NOV-1991; US-799859.  
 03-NOV-1994; US-334884.  
 07-JUN-1995; US-472964.  
 PA (RHON ) RHONE-POULENC RORER PHARM INC.  
 PI Burgess W, Drohan WN, Jaye M, MacIag T;  
 DR WPI; 96-503421/50.  
 DR N-PSDB; T45983.  
 PT Recombinant human endothelial cell growth factors - for treating  
 PS damaged blood vessels, etc.  
 PS Claim 1: Column 16; 22pp; English.  
 CC Human recombinant endothelial cell growth factors (ECGF) beta  
 CC (W06816) and alpha (W06817) differ only at their N-terminal ends.  
 CC They can be produced in transformed prokaryotic or eukaryotic host  
 CC cells using DNA sequences (T45983 and T45984, respectively) derived  
 CC from the complete human ECGF cDNA (T45985). Large quantities of  
 CC the ECGFs are produced by culturing the host cells and recovering  
 CC the proteins. ECGFs have utility in the growth and amplification  
 CC of endothelial cells in culture. They can potentially be used to  
 CC treat damaged blood vessels and other endothelial cell-lined  
 CC structures, and also have diagnostic applns.  
 SQ Sequence 154 AA;

Query Match 49.7%; Score 984; DB 1; Length 154;  
 Best Local Similarity 99.3%; Pred. No. 3.21e-78;  
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 20 GNYKKPILYCSNGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGOYL 79  
 :|||||  
 QY 147 ANYKKPILYCSNGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGOYL 206  
 :|||||

Db 80 AMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 139  
 :|||||  
 QY 207 AMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 266  
 :|||||

Db 140 GQKAILFLPLPVSSD 154  
 :|||||  
 QY 267 GQKAILFLPLPVSSD 281  
 :|||||

RESULT 12  
 ID W75414 standard; protein; 154 AA.  
 AC W75414;  
 DT 02-MAR-1999 (first entry)  
 DE Human beta-endothelial cell growth factor.  
 KW Human; endothelial cell growth factor; ECGF; brain stem; probe;  
 KW hybridisation; bovine; wound healing; prosthetic device.  
 OS Homo sapiens.  
 PN US5827826-A.  
 27-OCT-1998.

Query Match 49.7%; Score 984; DB 1; Length 154;  
 Best Local Similarity 99.3%; Pred. No. 3.21e-78;  
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 20 GNYKKPILYCSNGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGOYL 79  
 :|||||  
 QY 147 ANYKKPILYCSNGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGOYL 206  
 :|||||

Db 80 AMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 139  
 :|||||  
 QY 207 AMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 266  
 :|||||

Db 140 GQKAILFLPLPVSSD 154  
 :|||||  
 QY 267 GQKAILFLPLPVSSD 281  
 :|||||

PF 04-NOV-1996; 743261.  
 PR 04-NOV-1996; US-743261.  
 PR 03-MAR-1986; US-835594.  
 PR 18-DEC-1987; US-134499.  
 PR 29-APR-1991; US-693079.  
 PR 27-NOV-1991; US-799859.  
 PR 03-NOV-1994; US-334884.  
 PR 07-JUN-1995; US-472964.  
 PA (RHON ) RHONE-POULENC RORER PHARM INC.  
 PI Burgess W, Drohan WN, Jaye M, MacIag T;  
 DR WPI; 98-594032/50.  
 DR Compositions for promoting wound healing - containing endothelial  
 PT cell growth factor polypeptides  
 PS Claim 1: Column 16; 23pp; English.  
 CC This sequence represents the amino acid sequence of the mature human  
 CC beta-endothelial cell growth factor (b-ECGF). This amino acid sequence  
 CC is identical to the alpha-ECGF but the beta sequence contains an extra  
 CC 20 N-terminal amino acids. The sequence was isolated from a human brain  
 CC stem cell cDNA library using a probe designed based on fragments of the  
 CC bovine ECGF (see W75416-W75418). The ECGF protein can be used in  
 CC compositions for promoting wound healing. ECGF is also used to grow  
 CC cells on a prosthetic device.  
 SQ Sequence 154 AA;

Query Match 49.7%; Score 984; DB 1; Length 154;  
 Best Local Similarity 99.3%; Pred. No. 3.21e-78;  
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 20 GNYKKPILYCSNGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGOYL 79  
 :|||||  
 QY 147 ANYKKPILYCSNGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGOYL 206  
 :|||||

Db 80 AMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 139  
 :|||||  
 QY 207 AMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 266  
 :|||||

Db 140 GQKAILFLPLPVSSD 154  
 :|||||  
 QY 267 GQKAILFLPLPVSSD 281  
 :|||||

RESULT 13  
 ID P94037 standard; protein; 155 AA.  
 AC P94037;  
 DT 25-JUN-1990 (first entry)  
 DE Human acidic fibroblast growth factor.  
 KW Acidic fibroblast growth factor.  
 OS Homo sapiens.  
 PN EP-298723-A.  
 PD 11-JAN-1989.  
 PF 06-JUL-1988; 306158.  
 PR 07-JUL-1987; US-070797.  
 PA (BIOT-) Biotechn Res Assoc.  
 PI Fiddes JC, Abraham JA, Protter A;  
 DR WPI; 89-009785/02.  
 DR N-PSDB; N93088.  
 PT Recombinant DNA encoding new fibroblast growth factor  
 PT analogues - useful eg for accelerating wound healing and  
 PT to control neovascularisation.  
 PS Disclosure; p; English.  
 CC See also P94038.  
 SQ Sequence 155 AA;

Query Match 49.7%; Score 984; DB 1; Length 155;  
 Best Local Similarity 99.3%; Pred. No. 3.21e-78;  
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 21 GNYKKPILYCSNGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGOYL 80  
 :|||||  
 QY 147 ANYKKPILYCSNGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGOYL 206  
 :|||||

Db 81 AMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 140  
 :|||||

QY 207 AMDTDGLLYGSGTNPNECLFLERLEENHNTYISKKHAENWVGLKKNKSGCKRGPRTHY 266  
 Db 141 GOKAILFLPLPVSSD 155  
 QY 267 GOKAILFLPLPVSSD 281

## RESULT 14

ID R70812 standard; protein; 155 AA.  
 AC R70812;  
 DT 01-SEP-1995 (first entry)  
 DE FGF-1.  
 KW FGF-1; fibroblast growth factor; cytotoxic conjugate; fusion protein;  
 KW saporin; cytostatic; tumor; diabetes; rheumatoid arthritis.  
 OS Homo sapiens. Location/Qualifiers  
 FH Key misc\_difference 31 /note= "Cys may be replaced by Ser"  
 FT misc\_difference 132 /note= "Cys may be replaced by Ser"  
 FT misc\_difference 132 /note= "Cys may be replaced by Ser"  
 WO9503831-A.  
 09-FEB-1995.  
 27-JUL-1994; U08511.  
 PR 02-AUG-1993; US-099924.  
 PR 29-OCT-1993; US-145829.  
 PA (PRIZ-) PRIZM PHARM INC.  
 PA (WHIT-) WHITTIER INST DIABETES & ENDOCRINOLOGY.  
 PI Baird AJ, Lappi DA, Sosnowski BA;  
 DR WPI; 95-082038/11.  
 PT New monogenous preparations of cytotoxic conjugates and DNA -  
 PT contain fibroblast growth factors and cytotoxic agents for  
 PT treating FGF conditions such as tumours, diabetes and rheumatoid  
 PT arthritis.  
 PS Disclosure; Page 108-109; 128pp; English.  
 CC Novel fusion proteins comprise FGF linked to saporin. FGF-1 to -9  
 CC may be used, pref. FGF-1 (R70812), FGF-5 (R70813), FGF-7 (R70814) or  
 CC FGF-8 (R70815) mutins, in which at least 1 Cys residue is replaced  
 CC by conservative Ser substitutions. The fusion proteins are potent  
 CC cytotoxic agents to cells bearing the FGF receptor.  
 SQ Sequence 155 AA;

Query Match 49.7%; Score 984; DB 1; Length 155;  
 Best Local Similarity 99.3%; Pred. No. 3.21e-78;  
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHLOLSAESVGEVYIKSTETGOYL 80  
 QY :|||||  
 147 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHLOLSAESVGEVYIKSTETGOYL 206  
 81 AMDTDGLLYGSGTNPNECLFLERLEENHNTYISKKHAENWVGLKKNKSGCKRGPRTHY 140  
 QY :|||||  
 207 AMDTDGLLYGSGTNPNECLFLERLEENHNTYISKKHAENWVGLKKNKSGCKRGPRTHY 266  
 Db 141 GOKAILFLPLPVSSD 155  
 QY :|||||  
 267 GOKAILFLPLPVSSD 281

## RESULT 15

ID P70482 standard; Protein; 155 AA.  
 AC P70482;  
 DT 13-MAY-1991 (first entry)  
 DE Sequence encoded by complete cDNA sequence of human endothelial  
 DE cell growth factor (ECGF).  
 KW Endothelial cell regeneration; blood vessel regeneration.  
 OS Homo sapiens.  
 FH Key Location/Qualifiers  
 FT protein 2..15  
 FT /label= Beta ECGF  
 FT protein 16..21  
 FT /label= Acidic FGF  
 FT protein 22..155  
 FT /label= Alpha ECGF

PN W08705332-A.  
 PD 11-SEP-1987.  
 PF 02-MAR-1987; U00425.  
 PR 03-MAR-1986; US-835594.  
 PR 26-MAR-1987; ES-000812.  
 PA (MELO-) MELOY LAB INC.  
 PA (RORE-) RORER BIOTECHN INC.  
 PA (RORE-) RORER.  
 PA BIOTECH INC.  
 PI Jaye M, Burgess W, Maciag T, Drohan W;  
 DR WPI; 87-264128/37.  
 DR N-PSDB; N70788  
 PT Human endothelial cell growth factor - produced by recombinant  
 PT DNA techniques, useful for wound healing  
 PS Example; Fig 8; 43pp; English.  
 CC To screen the human brain stem cDNA library for clones contg. ECGF  
 CC inserts, a specific oligonucleotide was designed. This  
 CC oligonucleotide was based upon a partial AA sequence analysis of  
 CC the amino terminus of ECGF (see P70480 and P70481). Fig 3c sets  
 CC forth for comparison the AA sequence of cyanogen bromide-cleaved  
 CC bovine alpha and beta ECGF (P70834). The two clones that were  
 CC isolated, ECGF clones 1 and 29, were analysed in further detail. The  
 CC nucleotide sequence of these clones and the AA sequence deduced from  
 CC the nucleic acid sequence is shown in Fig 8 (see N70788 and P70482).  
 SQ Sequence 155 AA;

Query Match 49.7%; Score 984; DB 1; Length 155;  
 Best Local Similarity 99.3%; Pred. No. 3.21e-78;  
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHLOLSAESVGEVYIKSTETGOYL 80  
 QY :|||||  
 147 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHLOLSAESVGEVYIKSTETGOYL 206  
 81 AMDTDGLLYGSGTNPNECLFLERLEENHNTYISKKHAENWVGLKKNKSGCKRGPRTHY 140  
 QY :|||||  
 207 AMDTDGLLYGSGTNPNECLFLERLEENHNTYISKKHAENWVGLKKNKSGCKRGPRTHY 266  
 Db 141 GOKAILFLPLPVSSD 155  
 QY :|||||  
 267 GOKAILFLPLPVSSD 281

Search completed: Tue Aug 29 16:06:43 2000  
 Job time : 31 secs.

\*\*\*\*\*  
MPSrch\_pp protein - protein database search, using Smith-Waterman algorithm  
\*\*\*\*\*

\*\*\*\*\* (TM) \*\*\*\*\*

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MPSrch\_pp protein - protein database search, using Smith-Waterman algorithm  
on: Tue Aug 29 16:04:37 2000; MasPar time 15.90 Seconds  
833.849 Million cell updates/sec  
Regular output not generated.

Title: >US-09-121-017B-23  
Description: (1-281) from US09121017B.pep  
Perfect Score: 1980  
Sequence: 1 MAPARLALLFFVGGVAES.....PRTHYGOKAILFLPLPVSSD 281

Scoring table: PAM 150  
Gap 11

Searched: 142080 seqs, 47172406 residues

Post-processing: Minimum Match 0\$  
Listing first 45 summaries

Database: Pir64  
1:pir1 2:pir2 3:pir3 4:pir4  
Statistics: Mean 46.699; Variance 90.971; scale 0.513

Pred. No. is the number of results predicted by chance to have a  
score greater than or equal to the score of the result being printed,  
and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description	Pred. No.
1	993	50.2	198	2	JC1457 ryudocan precursor	4.09e-177
2	984	49.7	155	1	A33665 acidic fibroblast gro	3.37e-175
3	967	48.8	155	1	A60721 acidic fibroblast gro	1.39e-171
4	967	48.8	155	2	S04147 acidic fibroblast gro	1.39e-171
5	967	48.8	155	2	D37360 acidic fibroblast gro	1.39e-171
6	953	48.1	152	2	JH0476 acidic fibroblast gro	1.32e-168
7	918	46.4	155	1	GKBOA acidic fibroblast gro	3.55e-161
8	917	46.3	155	2	A60130 acidic fibroblast gro	5.79e-161
9	907	45.8	155	2	JW0055 fibroblast growth fac	7.64e-159
10	679	34.3	202	2	A42410 ryudocan precursor	6.80e-111
11	642	32.4	198	2	JC5613 ryudocan precursor	3.34e-103
12	522	26.4	199	2	A48834 basic fibroblast gro	1.66e-78
13	516	26.1	146	1	S00185 basic fibroblast gro	2.77e-77
14	516	26.1	157	1	GKBOB basic fibroblast gro	2.77e-77
15	508	25.7	154	2	A31674 basic fibroblast gro	1.18e-75
16	508	25.7	154	2	C37360 basic fibroblast gro	1.18e-75
17	509	25.7	210	2	A32398 basic fibroblast gro	7.37e-76
18	498	25.2	164	2	S31622 basic fibroblast gro	1.27e-73
19	489	24.7	155	1	A40117 basic fibroblast gro	8.48e-72
20	466	23.5	137	2	I46711 fibroblast growth fac	3.78e-67
21	351	17.7	208	2	A48137 fibroblast growth fac	2.53e-44
22	351	17.7	208	2	S66486 fibroblast growth fac	2.53e-44
23	329	16.6	207	2	JC5941 fibroblast growth fac	4.64e-40

24	324	16.4	207	2	JC5940	fibroblast growth fac	4.26e-39
25	314	15.9	194	2	S49501	keratinocyte growth f	3.54e-37
26	311	15.7	194	1	A36301	keratinocyte growth f	1.33e-36
27	303	15.3	194	2	I48610	keratinocyte growth f	4.44e-35
28	301	15.2	194	2	S26049	fibroblast growth fac	1.07e-34
29	288	14.5	187	2	S23595	embryonic fibroblast	3.08e-32
30	283	14.3	264	2	A36207	transforming protein	2.69e-31
31	283	14.3	266	2	S68144	fibroblast growth fac	2.69e-31
32	275	13.9	192	2	S54407	embryonic Fibroblast	8.57e-30
33	276	13.9	194	2	I50710	fibroblast growth fac	5.54e-30
34	273	13.8	206	2	JC4268	HST protein - bovine	2.01e-29
35	271	13.7	256	2	JC4627	fibroblast growth fac	4.75e-29
36	269	13.6	267	1	TVHUF5	transforming protein	1.12e-28
37	265	13.4	60	2	JH0708	fibroblast growth fac	6.21e-28
38	265	13.4	197	2	A53126	syndecan-4 precursor	6.21e-28
39	257	13.0	168	2	JG0184	fibroblast growth fac	1.88e-26
40	258	13.0	206	1	S20102	fibroblast growth fac	1.23e-26
41	255	12.9	206	1	TVHHS	fibroblast growth fac	4.39e-26
42	251	12.7	220	2	I50588	FGF-3 - chicken	2.39e-25
43	244	12.3	208	2	S14192	fibroblast growth fac	4.56e-24
44	240	12.1	237	1	S39582	transforming protein	2.44e-23
45	237	12.0	245	1	TVNST2	transforming protein	8.55e-23

ALIGNMENTS

RESULT 1  
ENTRY JC1457 #type complete  
TITLE ryudocan precursor - human  
ALTERNATE\_NAMES amphiglycan; core protein  
ORGANISM #formal\_name Homo sapiens #common\_name man  
DATE 30-Sep-1993 #sequence\_revision 30-Sep-1993 #text\_change 17-Mar-1999  
ACCESSIONS JC1457; S26695  
REFERENCE JC1457  
#authors Kojima, T.; Inazawa, J.; Takamatsu, J.; Rosenberg, R.D.; Satio, H.  
#journal Biochem. Biophys. Res. Commun. (1993) 190:814-822  
#title Human ryudocan core protein: Molecular cloning and characterization of the cDNA, and chromosomal localization of the gene.  
#cross-references MUID:93176185  
#accession JC1457  
#molecule\_type mRNA  
#residues 1-198 #label KOJ  
#cross-references DBJ:DL3292; NID:g286020; PID:d1003053; PID:g286021  
REFERENCE S26695  
#authors David, G.; van der Schueren, B.; Marynen, P.; Cassiman, J.J.; van den Berghe, H.  
#journal J. Cell Biol. (1992) 118:961-969  
#title Molecular cloning of amphiglycan, a novel integral membrane heparan sulfate proteoglycan expressed by epithelial and fibroblastic cells.  
#cross-references MUID:92363936  
#accession S26695  
#status preliminary  
#molecule\_type mRNA  
#residues 1-11, L' 13-198 #label DAV  
#cross-references EMBL:X67016; NID:g28679; PID:g28680  
GENETICS  
#map\_position 20q12  
KEYWORDS chondroitin sulfate proteoglycan; core protein; glycoprotein; heparan sulfate; transmembrane protein  
FEATURE  
1-18 #domain signal sequence #status predicted #label SIG  
19-198 #product ryudocan #status predicted #label MAT  
146-170 #domain transmembrane #status predicted #label TMW  
39,61,63 #binding\_site heparan sulfate (Ser) (covalent) #status predicted  
SUMMARY  
#length 198 #molecular-weight 21641 #checksum 4522  
Query Match 50.2%; Score 993; DB 2; Length 198;  
Best Local Similarity 100.0%; Pred. No. 4.09e-177;

Matches	146;	Conservative	0;	Mismatches	0;	Indels	0;	Gaps	0;
Db	1	MAPARLALLFFVGGVAESIRETEVIDPDLLEGYFSGALPDDDDVYVGQESDDFEL	60						
QY	1	MAPARLALLFFVGGVAESIRETEVIDPDLLEGYFSGALPDDDDVYVGQESDDFEL	60						
Db	61	SGSGDLDLSDSMIGPEVHVPLVPLDNHPIPERAGSGSQVTPTEPKLEENEVIPKRISPVE	120						
QY	61	SGSGDLDLSDSMIGPEVHVPLVPLDNHPIPERAGSGSQVTPTEPKLEENEVIPKRISPVE	120						
Db	121	ESEDVSNKYVSMSTVQSGNIFERTEV	146						
QY	121	ESEDVSNKYVSMSTVQSGNIFERTEV	146						
RESULT	2								
ENTRY		A33665	#type complete						
TITLE		acidic fibroblast growth factor 1 precursor - human							
ALTERNATE_NAMES		beta-ECGF; endothelial cell growth factor beta;							
ORGANISM		heparin-binding growth factor 1							
DATE		#formal_name Homo sapiens #common_name man							
		10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change							
ACCESSIONS		A33665; A32316; S18217; A43804; A24662; JH0707; S35535;							
		S35536; I39413; A23553; A24820; A24243; A24301; A26386;							
REFERENCE		A33639							
#authors		Margia, A.; Tischer, E.; Graves, D.; Tumolo, A.; Miller, J.;							
		Gospodarowicz, D.; Abraham, J.A.; Shipley, G.D.; Fiddes,							
		J.C.							
#journal		Biochem. Biophys. Res. Commun. (1989) 164:1121-1129							
#title		Structural analysis of the gene for human acidic fibroblast							
		growth factor.							
#cross-references		MUID:90073637							
#accession		A33665							
		#molecule_type DNA							
		#residues 1-155 #label MER							
		##cross-references GB:M30491							
REFERENCE		A32316							
#authors		Wang, W.P.; Lehtoma, K.; Varban, M.L.; Krishnan, I.; Chiu,							
		I.M.							
#journal		Mol. Cell. Biol. (1989) 9:2387-2395							
#title		Cloning of the gene coding for human class 1 heparin-binding							
		growth factor and its expression in fetal tissues.							
#cross-references		MUID:89343957							
#accession		A32316							
		#molecule_type DNA							
		#residues 1-155 #label WAN							
		##cross-references GB:M23087; NID:G183875; PIDN:AAA52638.1; PID:G386768							
REFERENCE		S18217							
#authors		Wang, W.P.; Quick, D.; Balcerzak, S.P.; Needleman, S.W.;							
		Chiu, I.M.							
#journal		Oncogene (1991) 6:1521-1529							
#title		Cloning and sequence analysis of the human acidic fibroblast							
		growth factor gene and its preservation in leukemia							
		patients.							
#cross-references		MUID:92019819							
#accession		S18217							
		#molecule_type DNA							
		#residues 1-155 #label WA2							
		##cross-references EMBL:M23086							
REFERENCE		A43804							
#authors		Chiu, I.M.; Wang, W.P.; Lehtoma, K.							
#journal		Oncogene (1990) 5:755-762							
#title		Alternative splicing generates two forms of mRNA coding for							
		human heparin-binding growth factor 1.							
#cross-references		MUID:90265618							
#accession		A43804							
		#molecule_type mRNA							
		#residues 1-155 #label CHI							
		##cross-references EMBL:X51943; NID:G32435; PIDN:CAA36206.1; PID:G32436							
REFERENCE		A24662							
#authors		Jaye, M.; Howk, R.; Burgess, W.;							



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#cross-references MUID:86186784
#accession A24243
#molecule_type protein
#residues 16-47 #label GI2
#experimental_source brain
REFERENCE
A91364
#authors Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
#journal FEBS Lett. (1986) 204:203-207
#title Partial molecular characterization of endothelial cell
mitogens from human brain: acidic and basic fibroblast
growth factors.
#cross-references MUID:86275260
#accession A24301
#molecule_type protein
#residues 16-30,'X',32-49 #label GAU
REFERENCE
A26386
#authors Gautschi-Sova, P.; Muller, T.; Bohlen, P.
#journal Biochem. Biophys. Res. Commun. (1986) 140:874-880
#title Amino acid sequence of human acidic fibroblast growth factor.
#cross-references MUID:87048871
#accession A26386
#molecule_type protein
#residues 16-155 #label GA2
#experimental_source brain
REFERENCE
A53639
#authors Chavan, A.J.; Haley, B.E.; Volkin, D.B.; Marfia, K.E.;
Verticelli, A.M.; Bruner, M.W.; Draper, J.P.; Burke, C.J.;
Middaugh, C.R.
#journal Biochemistry (1994) 33:7193-7202
#title Interaction of nucleotides with acidic fibroblast growth
factor (FGF-1).
#cross-references MUID:94271773
#accession A53639
#molecule_type protein
#residues 16-30,'X',32-38;73-75,'X',77-97,'X',99-101;128-131,'X',
133-140,'X',142-152 #label CHA
GENETICS
#gene GDB:FGF1; FGFA
#cross-references GDB:119909; OMIM:131220
#map_position 5q31.3-5q33.2
#introns 57/1; 91/3
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS alternative splicing; growth factor; heparin binding
FEATURE
16-155 #product fibroblast growth factor 1 #status experimental
129 #label MAT\
#binding_site carbohydrate (Asn) (covalent) #status
absent
#length 155 #molecular-weight 17460 #checksum 9243
#MARY
Query Match 49.7%; Score 984; DB 1; Length 155;
Best Local Similarity 99.3%; Pred. No. 3.37e-175;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;
Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTETGQYL 80
:|||||
QY 147 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTETGQYL 206
:|||||
Db 81 AMDTDGLLYGSQTPNEECFLERLEENHNYTYSKKHAEKNWFVGLKNGSCKRGPRTHY 140
:|||||
QY 207 AMDTDGLLYGSQTPNEECFLERLEENHNYTYSKKHAEKNWFVGLKNGSCKRGPRTHY 266
:|||||
#cross-references MUID:87048871
#accession A26386
#molecule_type protein
#residues 16-155 #label GA2
#experimental_source brain
REFERENCE
A53639
#authors Chavan, A.J.; Haley, B.E.; Volkin, D.B.; Marfia, K.E.;
Verticelli, A.M.; Bruner, M.W.; Draper, J.P.; Burke, C.J.;
Middaugh, C.R.
#journal Biochemistry (1994) 33:7193-7202
#title Interaction of nucleotides with acidic fibroblast growth
factor (FGF-1).
#cross-references MUID:94271773
#accession A53639
#molecule_type protein
#residues 16-30,'X',32-38;73-75,'X',77-97,'X',99-101;128-131,'X',
133-140,'X',142-152 #label CHA

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10-Sep-1999
A60721
#accessions
REFERENCE
#authors Hall, J.A.; Harris, M.A.; Malark, M.; Mansson, P.E.; Zhou,
H.; Harris, S.E.
#journal J. Cell. Biochem. (1990) 43:17-26
#title Characterization of the hamster DDT-1 cell aFGF/HGBF-I gene
and cDNA and its modulation by steroids.
#cross-references MUID:90270291
#accession A60721
#status not compared with conceptual translation
#molecule_type DNA
#residues 1-155 #label HAL
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17403 #checksum 9573
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Best Local Similarity 97.0%; Pred. No. 1.39e-171;
Matches 131; Conservative 2; Mismatches 2; Indels 0; Gaps 0;
Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTETGQYL 80
:|||||
QY 147 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTETGQYL 206
:|||||
Db 81 AMDTDGLLYGSQTPNEECFLERLEENHNYTYSKKHAEKNWFVGLKNGSCKRGPRTHY 140
:|||||
QY 207 AMDTDGLLYGSQTPNEECFLERLEENHNYTYSKKHAEKNWFVGLKNGSCKRGPRTHY 266
:|||||
Db 141 GQKAILFLPLPVSSD 155
:|||||
QY 267 GQKAILFLPLPVSSD 281
:|||||
RESULT 4
ENTRY S04147 #type complete
TITLE acidic fibroblast growth factor 1 - rat
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Rattus norvegicus #common_name Norway rat
DATE 28-Feb-1990 #sequence_revision 28-Feb-1990 #text_change
16-Jul-1999
A60721
#accessions
REFERENCE
#authors Goodrich, S.P.; Yan, G.C.; Bahrenburg, K.; Mansson, P.E.
#journal Nucleic Acids Res. (1989) 17:2967
#title The nucleotide sequence of rat heparin binding growth factor
1 (HBGF-1).
#cross-references MUID:89240051
#accession S04147
#molecule_type mRNA
#residues 1-155 #label GOO
#cross-references EMBL:X14232; NID:g56351; PIDN:CAA32448.1; PID:g56352
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341
Query Match 48.8%; Score 967; DB 2; Length 155;
Best Local Similarity 95.6%; Pred. No. 1.39e-171;
Matches 130; Conservative 4; Mismatches 2; Indels 0; Gaps 0;
Db 20 LGNYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTETGQY 79
:|||||
QY 146 VANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTETGQY 205
:|||||
Db 80 LAMDTGGLLYGSQTPNEECFLERLEENHNYTYSKKHAEKNWFVGLKNGSCKRGPRTHY 139
:|||||
QY 206 LAMDTGGLLYGSQTPNEECFLERLEENHNYTYSKKHAEKNWFVGLKNGSCKRGPRTHY 265
:|||||
Db 140 YQKAILFLPLPVSSD 155
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QY 266 YQKAILFLPLPVSSD 281
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RESULT 3
ENTRY A60721 #type complete
TITLE acidic fibroblast growth factor - golden hamster
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Mesocricetus auratus #common_name golden hamster
DATE 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change

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RESULT 5
ENTRY
  D37360      #type complete
  TITLE      acidic fibroblast growth factor - mouse
  ALTERNATE_NAMES
  #formal_name Mus musculus #common_name house mouse
  #formal_revision 17-Apr-1993 #text_change
  DATE      16-Jul-1999
ACCESSIONS
  D37360; JC5231
REFERENCE
  #authors
  Hebert, J.M.; Basilio, C.; Goldfarb, M.; Haub, O.; Martin, G.R.
  #journal
  Dev. Biol. (1990) 138:454-463
  #title
  Isolation of cDNAs encoding four mouse FGF family members and characterization of their expression patterns during embryogenesis.
#cross-references
#accession MUID:90201563
#status
#molecule_type mRNA
#residues 1-155 #label HEB
#cross-references GB:M30641; NID:g193284; PIDN:AAA37618.1; PID:g309236
REFERENCE
  JC5231
  #authors
  Madai, F.; Hackshaw, K.V.; Chiu, I.M.
  #journal
  Gene (1996) 179:231-236
  #title
  Cloning and characterization of the mouse Fgf-1 gene.
#cross-references MUID:97128312
#accession
  JC5231
#status
#molecule_type DNA
#residues 1-155 #label MAD
#cross-references GB:U36456
COMMENT
  This protein is an inducer of neovascularization in angiogenic disease including atherosclerosis, cancer and inflammatory autoimmune disease.
GENETICS
#gene
  Fgf-1
#introns
  57/1; 91/3
CLASSIFICATION
  #superfamily fibroblast growth factor
SUMMARY
  #length 155 #molecular-weight 17417 #checksum 9341
Query Match 48.8%; Score 967; DB 2; Length 155;
Best Local Similarity 95.6%; Pred. No. 1.39e-171;
Matches 130; Conservative 4; Mismatches 2; Indels 0; Gaps 0;
Db 20 LGNYKPKLLYCSNGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEYIKSTETGQY 79
  ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
QY 146 VANYKPKLLYCSNGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEYIKSTETGQY 205
  ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
QY 80 LAMDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAENFVGLKNGSKRGPRTH 139
  ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
QY 206 LAMDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAENFVGLKNGSKRGPRTH 265
  ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
Db 140 YGQKAILFLPLVSSD 155
  ::::::::::::::::::::::
QY 266 YGQKAILFLPLVSSD 281
  ::::::::::::::::::::::
RESULT 6
ENTRY
  JH0476      #type fragment
  TITLE      acidic fibroblast growth factor - pig (fragment)
  ALTERNATE_NAMES
  #formal_name Sus scrofa domestica #common_name domestic pig
  #formal_revision 31-Mar-1992 #text_change
  DATE      16-Jul-1999
ACCESSIONS
  JH0476; S20072
REFERENCE
  #authors
  Schmidt, M.; Sharma, H.S.; Schott, R.J.; Schaper, W.
  #journal
  Biochem. Biophys. Res. Commun. (1991) 180:853-859
  #title
  Amplification and sequencing of mRNA encoding acidic fibroblast growth factor (aFGF) from porcine heart.
#cross-references MUID:92062117
#accession
  JH0476
#molecule_type mRNA
#residues 1-152 #label SCH

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#cross-references EMBL:X60317; NID:g1873; PIDN:CAA42869.1; PID:g1874
#experimental_source heart
#note
  the hydrophobic core residues are packed around the internal symmetry axis
COMMENT
  This protein belongs to the fibroblast growth factor family.
  CLASSIFICATION
  #superfamily fibroblast growth factor
  KEYWORDS
  growth factor; heparin binding
FEATURE
  22-28
  133
  #region nuclear location signal\
  #binding_site heparin (Lys) #status predicted
  #length 152 #checksum 1124
SUMMARY
  Query Match 48.1%; Score 953; DB 2; Length 152;
  Best Local Similarity 97.0%; Pred. No. 1.32e-168;
  Matches 128; Conservative 2; Mismatches 2; Indels 0; Gaps 0;
Db 21 GNYKPKLLYCSNGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 80
  ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
QY 147 ANYKPKLLYCSNGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 206
  ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
Db 81 AMDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAENFVGLKNGSKRGPRTH 140
  ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
QY 207 AMDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAENFVGLKNGSKRGPRTH 266
  ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
Db 141 GOKAILFLPLPV 152
  ::::::::::::::
QY 267 GOKAILFLPLPV 278
  ::::::::::::::
RESULT 7
ENTRY
  GKBOA      #type complete
  TITLE      acidic fibroblast growth factor precursor - bovine
  ALTERNATE_NAMES
  aFGF; eye-derived growth factor II; heparin-binding growth factor I; prostatin
  ORGANISM
  #formal_name Bos primigenius taurus #common_name cattle
  #formal_revision 13-Aug-1986 #sequence_revision 03-Feb-1994 #text_change
  DATE      18-Jun-1999
ACCESSIONS
  JH0613; S02102; S02661; S22065; B24663; A94281; S03953;
  A91010; A24477; B25043; C25043; A25043; A24539; A50884;
  A37892; B37892; A61198; I46024; A34477; A01385
  JH0613
REFERENCE
  #authors
  Renaud, F.; Desset, S.; Bugra, K.; Halley, C.; Philippe, J.M.; Courtois, Y.; Laurent, M.
  #journal
  Biochem. Biophys. Res. Commun. (1992) 184:945-952
  #title
  Heterogeneity of 3' untranslated region of bovine acidic FGF transcripts.
#cross-references MUID:92246990
#accession
  JH0613
#molecule_type DNA
#residues 58-155 #label REN
REFERENCE
  S02102
  #authors
  Halley, C.; Courtois, Y.; Laurent, M.
  #journal
  Nucleic Acids Res. (1988) 16:10913
  #title
  Nucleotide sequence of bovine acidic fibroblast growth factor cDNA.
#cross-references MUID:89083506
#accession
  S02102
#molecule_type mRNA
#residues 1-155 #label HAL
#cross-references EMBL:X13221; NID:g347; PIDN:CAA31610.1; PID:g348
REFERENCE
  S02661
  #authors
  Alterio, J.; Halley, C.; Brou, C.; Soussi, T.; Courtois, Y.; Laurent, M.
  #journal
  FEBS Lett. (1988) 242:41-46
  #title
  Characterization of a bovine acidic FGF cDNA clone and its expression in brain and retina.
#cross-references MUID:89078619
#accession
  S02661
#molecule_type mRNA
#residues 1-155 #label ALT
#cross-references EMBL:X14032; NID:g322; PIDN:CAA32192.1; PID:g323
  S22065
REFERENCE
  #authors
  Philippe, J.M.

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#submission submitted to the EMBL Data Library, May 1992
#accession S22065
#molecule_type mRNA
#residues 1-18 #label PHI
#cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
REFERENCE
#authors Abraham, J.A.; Merz, J.A.; Whang, J.L.; Tumolo, A.; Friedman, J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal Science (1986) 233:545-548
#title Nucleotide sequence of a bovine clone encoding the angiogenic protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession B24663
#molecule_type mRNA
#residues 62-102 #label ABR
REFERENCE
#authors Gimenez-Gallego, G.; Rodkey, J.; Bennett, C.; Rios-Candelore, M.; DiSalvo, J.; Thomas, K.
#journal Science (1985) 230:1385-1388
#title Brain-derived acidic fibroblast growth factor: complete amino acid sequence and homologies.
#cross-references MUID:86070224
#accession A94281
#molecule_type protein
#residues 16-155 #label GIM
REFERENCE
#authors Quinkler, W.; Maasberg, M.; Bernotat-Danielowski, S.; Luethe, N.; Sharma, H.S.; Schnaper, W.
#journal Eur. J. Biochem. (1989) 181:67-73
#title Isolation of heparin-binding growth factors from bovine, porcine and canine hearts.
#cross-references MUID:89231704
#accession S03953
#molecule_type protein
#residues 16-45 #label QUI
REFERENCE
#authors Bohlen, P.; Esch, F.; Baird, A.; Gospodarowicz, D.
#journal EMBO J. (1985) 4:1951-1956
#title Acidic fibroblast growth factor (FGF) from bovine brain: amino-terminal sequence and comparison with basic FGF.
#cross-references MUID:86055750
#accession A91010
#molecule_type protein
#residues 16-30,'X',32-34,'X',36-44 #label BOH
REFERENCE
#authors Crabb, J.W.; Ames, L.G.; Carr, S.A.; Johnson, C.M.; Roberts, G.D.; Bordoli, R.S.; McKeenhan, W.D.
#journal Biochemistry (1986) 25:4988-4993
#title Complete primary structure of prostatin, a prostate epithelial cell growth factor.
#cross-references MUID:87026586
#accession A24477
#molecule_type protein
#residues 2,'GE',5-155 #label CRA
REFERENCE
#authors Burgess, W.H.; Mehman, T.; Marshak, D.R.; Fraser, B.A.; Maciag, T.
#journal Proc. Natl. Acad. Sci. U.S.A. (1986) 83:7216-7220
#title Structural evidence that endothelial cell growth factor beta is the precursor of both endothelial cell growth factor alpha and acidic fibroblast growth factor.
#cross-references MUID:87016918
#accession B25043
#molecule_type protein
#residues 2-155 #label BUR
#note this form was designated beta endothelial cell growth factor
#accession C25043
#molecule_type protein
#residues 16-155 #label BU2
#note this form was designated acidic fibroblast growth factor
#accession A25043
#molecule_type protein

```

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#residues 22-155 #label BU3
#note this form was designated alpha endothelial cell growth factor
REFERENCE
#authors Strydom, D.J.; Harper, J.W.; Lobb, R.R.
#journal Biochemistry (1986) 25:945-951
#title Amino acid sequence of bovine brain derived class 1 heparin-binding growth factor.
#cross-references MUID:86187766
#accession A24539
#molecule_type protein
#residues 16-155 #label STR
REFERENCE
#authors Thomas, K.A.; Gimenez-Gallego, G.; Rios-Candelore, M.; DiSalvo, J.
#journal J. Protein Chem. (1987) 6:163-171
#title Primary structure and mitogenic and angiogenic activities of brain-derived acidic fibroblast growth factor.
#accession A60884
#molecule_type protein
#residues 16-155 #label THO
REFERENCE
#authors Kuo, M.D.; Huang, S.S.; Huang, J.S.
#journal J. Biol. Chem. (1990) 265:16455-16463
#title Acidic fibroblast growth factor receptor purified from bovine liver is a novel protein tyrosine kinase.
#cross-references MUID:90375514
#accession A37892
#molecule_type protein
#residues 22-30,'X',32-38 #label KU2
#note this form was designated brain-derived growth factor A
#accession B37892
#molecule_type protein
#residues 62-76,'X',78-86 #label KUO
#note this sequence is an amino-terminal fragment of a form designated as brain-derived growth factor B
REFERENCE
#authors Hill, C.E.; Belford, D.A.; Godovac-Zimmermann, J.; Hendry, I.A.
#journal Brain Res. Dev. Brain Res. (1991) 63:13-19
#title Class 1 heparin binding growth factor promotes the differentiation but not the survival of ciliary neurones in vivo.
#cross-references MUID:92164087
#accession A61198
#molecule_type protein
#residues 11-26;28-50;53-110,'H',112,'NTY';134-155 #label HIL
REFERENCE
#authors Philippe, J.M.; Renaud, F.; Desset, S.; Laurent, M.; Mallet, J.; Courtois, Y.; Edwards, J.B.
#journal Biochem. Biophys. Res. Commun. (1992) 188:843-850
#title Cloning of two different 5' untranslated exons of bovine acidic fibroblast growth factor by the single strand ligation to single-stranded cDNA methodology.
#cross-references MUID:93075172
#accession I46024
#status translated from GB/EMBL/DBJ
#molecule_type mRNA
#residues 1-18 #label PH2
#cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
REFERENCE
#authors Sasaki, H.; Hoshi, H.; Hong, Y.M.; Suzuki, T.; Kato, T.; Sasaki, H.; Saito, M.; Youki, H.; Karube, K.; Konno, S.; Onodera, M.; Saito, T.; Aoyagi, S.
#journal J. Biol. Chem. (1989) 264:17606-17612
#title Purification of acidic fibroblast growth factor from bovine heart and its localization in the cardiac myocytes.
#cross-references MUID:90008933
#accession A34477
#status preliminary
#molecule_type protein
#residues 16-24;121-127;134-143 #label SAS
#experimental_source heart

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Db      20  LGNYKPKLLYCSNGGHFRIILPDGKVDGTRDRSDQHQLQLSAEDVGVEYIKSTASQY  79
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QY      146  VANYKPKLLYCSNGGHFRIILPDGTVGTGTRDRSDQHQLQLSAESVGVEYIKSTGTGQ  205

Db      80  LAMDTNGLLYGSLPGEECLFLERLEENHNPTYISKKHADKNWFVGLKKNKNSKLGPRTH  139

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RESULT      10
ENTRY
TITLE      A42410 #type complete
ALTERNATE_NAMES
            ryudocan precursor - rat
            amphiglycan; heparan sulfate proteoglycan core protein
            ryudocan
ORGANISM    #formal_name Rattus norvegicus #common_name Norway rat
DATE        04-Mar-1993 #sequence_revision 18-Nov-1994 #text_change
            20-Mar-1998
ACCESSIONS  A42410
REFERENCE   A42410
            #authors      Kojima, T.; Shworak, N.W.; Rosenberg, R.D.
            #journal      J. Biol. Chem. (1992) 267:4870-4877
            #title        Molecular cloning and expression of two distinct
                        CDNA-encoding heparan sulfate proteoglycan core proteins
                        from a rat endothelial cell line.
            #cross-references M0ID:92165852
            #accession     A42410
            #status        preliminary
            #molecule_type mRNA
            ##residues     1-202 ##label KOJ
            ##cross-references GB:M81786; NID:g206822; PID:g206823
            ##experimental_source endothelial cell line
            ##note          sequence extracted from NCHI backbone (NCBI:84028).

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Qy	56	DDFSLSGDLDDLEDNMIGPEVVVHPLVPLDNIHPIRAGSGSQVTEPKKLENEVIPKR	115
Db	117	-APSDVGDDMSNKVMSSTAQGSNIFERTEV	146
Qy	116	ISPVEEDVSNKVSMSSTVQGSNIFERTEV	146
RESULT	12		
ENTRY	A48834	#type complete	
TITLE		basic fibroblast growth factor - chicken	
ORGANISM		#formal_name Gallus gallus #common_name chicken	
DATE	01-Dec-1993	#sequence_revision 18-Nov-1994 #text_change	
ACCESSIONS	16-Jul-1999		
REFERENCE	A48834; S23636		
AUTHORS	A48834		
JOURNAL	Dev. Biol. (1993) 157:110-118		
TITLE	Expression of alternatively spliced bFGF first coding exons and antisense mRNAs during chicken embryogenesis.		
#cross-references	MUID:93246053		
#accession	A48834		
#status	preliminary		
#molecule_type	nucleic acid		
#residues	1-189 #label BOR		
#experimental_source	embryo		
#note	sequence extracted from NCBI backbone (NCBIN:131000, NCBI:P131001)		
REFERENCE	S23636		
AUTHORS	Mitrani, E.; Gruenbaum, Y.; Shohat, H.; Ziv, T.		
JOURNAL	Development (1990) 109:387-393		
TITLE	Fibroblast growth factor during mesoderm induction in the early chick embryo.		
#cross-references	MUID:90382254		
#accession	S23636		
#status	preliminary		
#molecule_type	DNA		
#residues	95-128 #label MIT		
#cross-references	EMBL:X56804; NID:G62855; PIDN:CAA401:9.1; PID:G62855		
CLASSIFICATION	#superfamily fibroblast growth factor		
SUMMARY	#length 189 #molecular-weight 20312 #checksum 8538		
Query Match	26.48; Score 522; DB 2; Length 139;		
Best Local Similarity	54.59; Pred. No. 1.66e-78;		
Matches	73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;		
Db	58	GHFKDPKRLKCKNGFFLRNPGRVDGVRKSDPHKILQQAEEGVVYKIGVSNANREL	117
Qy	147	ANYKKPLLKCSNGHGFLRLPDGTVDGTRDRSDHQIQLSAESVGFYIKSTETGQYL	206
Db	118	AMKEDGRLLALKATECFEERLESNNYTSRKYSD--WTVALKRFGQVKGPKGTG	175
Qy	207	AMDTDGLLYGSQTPNECLFLERLEENHYNTYSKKHAENKWFVGLKNGCKGRPTHY	266
Db	176	GQKAILFLPMSAKS	189
Qy	267	GQKAILFLPVS	280
RESULT	13		
ENTRY	S00185	#type complete	
TITLE		basic fibroblast growth factor - sheep	
ALTERNATE_NAMES	prostatropin		
ORGANISM	#formal_name Ovis orientalis aries, Ovis ammon aries		
DATE	10-Sep-1999	#sequence_revision 10-Sep-1999 #text_change	
ACCESSIONS	10-Sep-1999		
REFERENCE	S00185		
AUTHORS	Simpson, R.J.; Moritz, R.L.; Lloyd, C.J.; Fabri, L.J.; Nice, E.C.; Rubira, M.R.; Burgess, A.W.		
JOURNAL	FEBS Lett. (1987) 224:128-132		
TITLE	Primary structure of ovine pituitary basic fibroblast growth factor.		

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#cross-references MUID:88055577
#accession S00185
#molecule_type protein
#residues 1-146 #label SIM
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding; mitogen
FEATURE
18-22
107-110
SUMMARY
#region heparin binding #status predicted\
#region heparin binding #status predicted
#length 146 #molecular-weight 16434 #checksum 3560
Query Match 26.1%; Score 516; DB 1; Length 146;
Best Local Similarity 55.2%; Pred. No. 2.77e-77;
Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;

Db 15 GHFKDPRKLYCKNGGFLRIHPDGRVDGVREKSPHKLQLOAERGVSIGKVCANRYL 74
QY 147 ANYKKPLLYCSNGHFLRIILPDGTDRSDQHILQLSAESVGEVYIKSTETQYL 206
75 AMKEDGRLLASKCVTDCEFFERLESNNYTRGRKYS--SWYVALKRTGQYKLGPKTGP 132
207 AMDYDGLYGSQTNEECFLERLEENHYNTYISKKAENWFVGLKNGSKRGPRTHY 266
Db 133 GOKAILFLPMSAKS 146
QY 267 GOKAILFLPLPVS 280

RESULT 14
ENTRY GKBOB #type fragment
TITLE basic fibroblast growth factor precursor - bovine (fragment)
ALTERNATE_NAMES bFGF; kidney-derived growth factor; prostatriptan
ORGANISM #formal_name Bos primigenius taurus #common_name cattle
DATE 13-Aug-1986 #sequence_revision 02-Jun-1995 #text_change
ACCESSIONS A24663; A32878; A33784; A61550; A61551; A60310; A61094;
REFERENCE A01386; A60316; A22054; A24819
AUTHORS Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman,
J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
JOURNAL Science (1986) 233:545-548
TITLE Nucleotide sequence of a bovine clone encoding the angiogenic
protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession A24663
#molecule_type mRNA
#residues 3-157 #label ABR
#cross-references GB:M13440; NID:gl63049; PIDN:AAA30518.1; PTD:gl63050
#experimental_source pituitary gland
REFERENCE A90924
AUTHORS Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes,
J.C.
JOURNAL Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668
TITLE Human basic fibroblast growth factor: nucleotide sequence,
genomic organization, and expression in mammalian cells.
#cross-references MUID:87217066
#accession A32878
#molecule_type mRNA
#residues 3-157 #label AB2
REFERENCE A33784
AUTHORS Milner, P.G.; Li, Y.S.; Hoffman, R.M.; Kodner, C.M.; Siegel,
N.R.; Deuel, T.F.
JOURNAL Biochem. Biophys. Res. Commun. (1989) 165:1096-1103
TITLE A novel 17 kD heparin-binding growth factor (HBGF-8) in
bovine uterus: purification and N-terminal amino acid
sequence.
#cross-references MUID:90121211
#accession A33784
#molecule_type protein
#residues 1-14 #label MIL
#note demonstration of a possible alternative initiator or
splice junction
REFERENCE A61550

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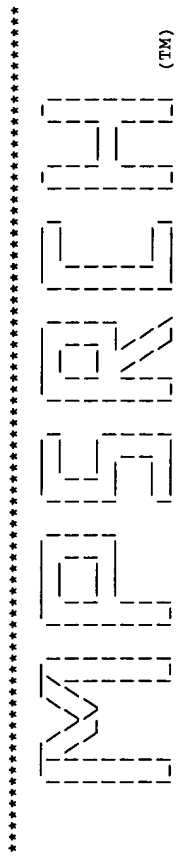
#authors Bertolini, J.; Hearn, M.T.W.
#journal Mol. Cell. Endocrinol. (1987) 51:187-199
#title Isolation, characterization and tissue localisation of an
N-terminal-truncated variant of fibroblast growth factor.
#cross-references MUID:87247652
#accession A61550
#molecule_type protein
#residues 16-35 #label BER
REFERENCE A61551
AUTHORS Ueno, N.; Baird, A.; Esch, F.; Ling, N.; Guillemin, R.
#journal Mol. Cell. Endocrinol. (1987) 49:189-194
#title Isolation and partial characterization of basic fibroblast
growth factor from bovine testis.
#cross-references MUID:87162856
#accession A61551
#molecule_type protein
#residues 27-35, 'X', 37-41 #label UE3
#experimental_source testes
#note this form appears to be identical to the renal form
REFERENCE A60310
AUTHORS Ueno, N.; Baird, A.; Esch, F.; Shimasaki, S.; Ling, N.;
Guillemin, R.
#journal Regul. Pept. (1986) 16:135-145
#title Purification and partial characterization of a mitogenic
factor from bovine liver: structural homology with basic
fibroblast growth factor.
#cross-references MUID:87119165
#accession A60310
#molecule_type protein
#residues 23-35, 'X', 37-42 #label UEN
#experimental_source liver
REFERENCE A24819
AUTHORS Ueno, N.; Baird, A.; Esch, F.; Ling, N.; Guillemin, R.
#journal Biochem. Biophys. Res. Commun. (1986) 138:580-588
#title Isolation of an amino terminal extended form of basic
fibroblast growth factor.
#cross-references MUID:86295737
#contents annotation
#note the amino end of this form was blocked; the peptide
composition matched what was thought to be the signal
sequence
REFERENCE A61094
AUTHORS Gospodarowicz, D.; Baird, A.; Cheng, J.; Lui, G.M.; Esch, F.;
Bohlen, P.
#journal Endocrinology (1986) 118:82-90
#title Isolation of fibroblast growth factor from bovine adrenal
gland: physicochemical and biological characterization.
#cross-references MUID:86081530
#accession A61094
#molecule_type protein
#residues 12-25, 27-35, 'X', 37-40 #label GOS
#experimental_source adrenal gland
REFERENCE A01386
AUTHORS Esch, F.; Baird, A.; Ling, N.; Ueno, N.; Hill, F.; Denoroy,
L.; Klepper, R.; Gospodarowicz, D.; Bohlen, P.; Guillemin,
R.
#journal Proc. Natl. Acad. Sci. U.S.A. (1985) 82:6507-6511
#title Primary structure of bovine pituitary basic fibroblast growth
factor (FGF) and comparison with the amino-terminal
sequence of bovine brain acidic FGF.
#cross-references MUID:86016731
#accession A01386
#molecule_type protein
#residues 12-157 #label ESC
#experimental_source pituitary gland
REFERENCE A60316
AUTHORS Baird, A.; Esch, F.; Bohlen, P.; Ling, N.; Gospodarowicz, D.
#journal Regul. Pept. (1985) 12:201-213
#title Isolation and partial characterization of an endothelial cell
growth factor from the bovine kidney: homology with basic
fibroblast growth factor.
#cross-references MUID:86095426
#accession A60316

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mpsrch\_pp protein - protein database search, using Smith-Waterman algorithm

on: Tue Aug 29 16:00:57 2000; MasPar time 10.20 Seconds  
853.576 Million cell updates/sec

ular output not generated.

Title: >US-09-121-017B-23  
Description: (1-281) from US09121017B.pep  
Perfect Score: 1980  
Sequence: 1 MAPARLFALLFFVGGVAES.....PRTHYGQKAILFLPLPVSSD 281

Scoring table: PAM 150  
Gap 11

Searched: 85661 seqs, 30989116 residues

Post-processing: Minimum Match 0%  
Listing first 45 summaries

Database: ~~sw4ss=prot38~~  
1: swissprot

Statistics: Mean 47.651; Variance 81.808; scale 0.582

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description	Pred. No.
1	993	50.2	198	1	SDC4_HUMAN	SYNDECAN-4 PRECURSOR ( 9.50e-201
2	984	49.7	155	1	FGF1_HUMAN	HEPARIN-BINDING GROWTH 1.41e-198
3	967	48.8	155	1	FGF1_MOUSE	HEPARIN-BINDING GROWTH 1.77e-194
4	967	48.8	155	1	FGF1_MESAU	HEPARIN-BINDING GROWTH 1.77e-194
5	953	48.1	152	1	FGF1_PTG	HEPARIN-BINDING GROWTH 4.17e-191
6	918	46.4	155	1	FGF1_BOVIN	HEPARIN-BINDING GROWTH 1.10e-182
7	917	46.3	155	1	FGF1_CHICK	HEPARIN-BINDING GROWTH 1.90e-182
8	679	34.3	202	1	SDC4_RAT	SYNDECAN-4 PRECURSOR ( 1.00e-125
9	642	32.4	198	1	SDC4_MOUSE	SYNDECAN-4 PRECURSOR ( 5.16e-117
10	522	26.4	158	1	FGF2_CHICK	HEPARIN-BINDING GROWTH 4.70e-89
11	516	26.1	155	1	FGF2_SHEEP	HEPARIN-BINDING GROWTH 1.14e-87
12	516	26.1	155	1	FGF2_BOVIN	HEPARIN-BINDING GROWTH 1.14e-87
13	508	25.7	154	1	FGF2_RAT	HEPARIN-BINDING GROWTH 7.91e-86
14	508	25.7	154	1	FGF2_MOUSE	HEPARIN-BINDING GROWTH 7.91e-86
15	509	25.7	155	1	FGF2_HUMAN	HEPARIN-BINDING GROWTH 4.66e-86
16	498	25.2	156	1	FGF2_MONDO	HEPARIN-BINDING GROWTH 1.59e-83
17	489	24.7	155	1	FGF2_XENLA	HEPARIN-BINDING GROWTH 1.83e-81
18	466	23.5	137	1	FGF2_RABIT	HEPARIN-BINDING GROWTH 3.34e-76
19	374	18.9	209	1	FGF9_XENLA	GLIA-ACTIVATING FACTOR 1.79e-55
20	351	17.7	208	1	FGF9_HUMAN	GLIA-ACTIVATING FACTOR 2.18e-50
21	351	17.7	208	1	FGF9_RAT	GLIA-ACTIVATING FACTOR 2.18e-50
22	350	17.7	208	1	FGF9_MOUSE	GLIA-ACTIVATING FACTOR 3.61e-50
23	329	16.6	207	1	FGFG_HUMAN	FIBROBLAST GROWTH FACT 1.43e-45

ALIGNMENTS

RESULT	ID	SDC4_HUMAN	STANDARD;	PRT;	198 AA.
AC	P31431	Q16833	000773;		
DT	01-JUL-1993	(Rel. 26, Created)			
DT	15-JUL-1998	(Rel. 36, Last sequence update)			
DT	15-FEB-2000	(Rel. 39, Last annotation update)			
DE	SYNDECAN-4 PRECURSOR (AMPHIGLYCAN) (SYND4) (RYUDOCAN CORE PROTEIN).				
GN	SDC4.				
OS	Homo sapiens (Human).				
OC	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;				
OC	Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.				
RN	[1]				
RP	SEQUENCE FROM N.A.				
RC	TISSUE=LUNG FIBROBLAST;				
RX	MEDLINE; 92363936.				
RA	David G., van der Schueren B., Marynen P., Cassiman J.-J.,				
RA	van den Berghe H.;				
RT	"Molecular cloning of amphiglycan, a novel integral membrane heparan				
RT	sulfate proteoglycan expressed by epithelial and fibroblastic				
RT	cells.";				
RL	J. Cell Biol. 118:961-969(1992).				
RP	[2]				
RN	SEQUENCE FROM N.A.				
RX	MEDLINE; 93176185.				
RA	Kojima T., Inazawa J., Takamatsu J., Rosenberg R.D., Saito H.;				
RT	"Human ryudocan core protein: molecular cloning and characterization				
RT	of the cDNA, and chromosomal localization of the gene.";				
RL	Biochem. Biophys. Res. Commun. 190:814-822(1993).				
RP	[3]				
RN	SEQUENCE FROM N.A.				
RC	TISSUE=PLACENTA;				
RX	MEDLINE; 96390006.				
RA	Tagaki A., Kojima T., Tsuzuki S., Katsumi A., Yamazaki T., Sugura I.,				
RA	Hanaguchi M., Saito H.;				
RT	"Structural organization and promoter activity of the human ryudocan				
RT	gene.";				
RL	J. Biochem. 119:979-984(1996).				
RN	[4]				
RP	SEQUENCE FROM N.A.				
RC	Bridgeman A.;				
RL	Submitted (APR-1999) to the EMBL/GenBank/DBJ databases.				
CC	-1- FUNCTION: CELL SURFACE PROTEOGLYCAN THAT BEAR HEPARAN SULFATE.				
CC	-1- SUBCELLULAR LOCATION: TYPE I MEMBRANE PROTEIN.				
CC	-1- TISSUE SPECIFICITY: EXPRESSED IN EPITHELIAL AND FIBROBLASTIC				
CC	CELLS.				
CC	-1- SIMILARITY: BELONGS TO THE SYNDECAN FAMILY OF INTEGRAL MEMBRANE				
CC	PROTEOGLYCANS.				







RT canine hearts.";  
 RL Eur. J. Biochem. 181:67-73(1989).  
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
 CC -!- SUBUNIT: MONOMER.  
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY  
 CC THAN DOES BFGF.  
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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 CC  
 CC EMBL; X60317; CAA42869.1; -;  
 CC PIR; S03954; S03954.  
 CC HSSP; P05230; 2AXM.  
 CC PFAM; PF00167; FGF; 1.  
 CC PROSITE; PS00247; HGF\_FGF; 1.  
 CC Growth factor; Mitogen; Vascularization; Heparin-binding.  
 CC PROPEP 1 15  
 CC CHAIN 16 >152 HEPARIN-BINDING GROWTH FACTOR 1.  
 CC CHAIN 22 >152 ENDOTHELIAL CELL GROWTH FACTOR ALPHA.  
 CC BINDING 24 28 HEPARIN (POTENTIAL).  
 CC BINDING 113 116 HEPARIN (POTENTIAL).  
 CC CONFLICT 31 31 C -> S (IN REF. 2).  
 CC CONFLICT 39 39 R -> Y (IN REF. 2).  
 CC NON\_TER 152 152  
 CC SEQUENCE 152 AA; 17103 MW; AE853B0A92F9ABF4 CRC64;  
 SQ  
 Query Match 48.1%; Score 953; DB 1; Length 152;  
 Best Local Similarity 97.0%; Pred. No. 4.17e-191;  
 Matches 128; Conservative 2; Mismatches 2; Indels 0; Gaps 0;  
 Db 21 GNYKPKLLYCSNGGHFLRLPDGTVGTRDSQDHIQLQLSAESVGEYIIRSTGTQYL 80  
 QY 147 ANYKPKLLYCSNGGHFLRLPDGTVGTRDSQDHIQLQLSAESVGEYIIRSTGTQYL 206  
 Db 81 AMDTGLLYGSTPSECEFLERLEENHYNTYTSKHAENFVGLKNGSKRGPRTHY 140  
 QY 207 ANDTGLLYGSTPNECEFLERLEENHYNTYTSKHAENFVGLKNGSKRGPRTHY 266  
 141 GKAILFLPLPV 152  
 267 GKAILFLPLPV 278  
 RESULT 6  
 ID FGF1\_BOVIN STANDARD; PRT: 155 AA.  
 AC P03968;  
 DT 23-OCT-1986 (Rel. 02, Created)  
 DT 01-MAR-1989 (Rel. 10, Last sequence update)  
 DT 15-JUL-1999 (Rel. 38, Last annotation update)  
 DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST  
 DE GROWTH FACTOR) (AFGF) (PROSTATROPIN) (ENDOTHELIAL CELL GROWTH FACTOR  
 DE BETA AND ALPHA CHAINS) (ACIDIC EYE-DERIVED GROWTH FACTOR II) (EDGF  
 DE II).  
 GN FGF1 OR FGF-1 OR FGFA OR HBGF-1 OR AFGF.  
 OS Bos taurus (Bovine).  
 OC Eukaryota; Metazoa; Chordata; Cranialata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;  
 OC Bovidae; Bovinae; Bos.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RC TISSUE-RETINA;  
 RX MEDLINE; 89083506.  
 RA Halley C., Courtois Y., Laurent M.;  
 RT "Nucleotide sequence of bovine acidic fibroblast growth factor cDNA.";

RL Nucleic Acids Res. 16:10913-10913(1988).  
 RN [2]  
 RP SEQUENCE FROM N.A.  
 RC TISSUE-RETINA;  
 RX MEDLINE; 89078619.  
 RA Alterio J., Halley C., Brou C., Soussi T., Courtois Y., Laurent M.;  
 RT "Characterization of a bovine acidic FGF cDNA clone and its  
 RL expression in brain and retina.";  
 RL FEBS Lett. 242:41-46(1988).  
 RN [3]  
 RP SEQUENCE OF 2-155.  
 RX MEDLINE; 87016918.  
 RA Burgess W.H., Mehlman T., Marshak D.R., Fraser B.A., Maciag T.;  
 RT "Structural evidence that endothelial cell growth factor beta is the  
 RT precursor of both endothelial cell growth factor alpha and acidic  
 RT fibroblast growth factor.";  
 RL Proc. Natl. Acad. Sci. U.S.A. 83:7216-7220(1986).  
 RN [4]  
 RP SEQUENCE OF 2-155.  
 RX MEDLINE; 87026586.  
 RA Crabb J.W., Ames L.G., Carr S.A., Johnson C.M., Roberts G.D.,  
 RA Bordoli R.S., McKeenan W.L.;  
 RT "Complete primary structure of prostatropin, a prostate epithelial  
 RT cell growth factor.";  
 RL Biochemistry 25:4988-4993(1986).  
 RN [5]  
 RP SEQUENCE OF 16-155.  
 RX MEDLINE; 86070224.  
 RA Gimenez-Gallego G., Rodkey J., Bennett C., Rios-Candelore M.,  
 RA Disalvo J., Thomas K.;  
 RT "Brain-derived acidic fibroblast growth factor: complete amino acid  
 RT sequence and homologues.";  
 RL Science 230:1385-1388(1985).  
 RN [6]  
 RP SEQUENCE OF 16-44, AND COMPOSITION.  
 RX MEDLINE; 86055750.  
 RA Boehlen P., Esch F., Baird A., Gospodarowicz D.;  
 RT "Acidic fibroblast growth factor (FGF) from bovine brain:  
 RT amino-terminal sequence and comparison with basic FGF.";  
 RL EMBO J. 4:1951-1956(1985).  
 RN [7]  
 RP SEQUENCE OF 16-56 FROM N.A.  
 RX MEDLINE; 86261806.  
 RA Abraham J.A., Mergia A., Whang J.L., Tumolo A., Friedman J.,  
 RA Hjerild K.A., Gospodarowicz D., Fiddes J.C.;  
 RT "Nucleotide sequence of a bovine clone encoding the angiogenic  
 RT protein, basic fibroblast growth factor.";  
 RL Science 233:545-548(1986).  
 RN [8]  
 RP SEQUENCE OF 16-45.  
 RX MEDLINE; 89231704.  
 RA Quinkler W., Maasberg M., Bernotat-Danielowski S., Luethke N.,  
 RA Sharma H.S., Schaper W.;  
 RT "Isolation of heparin-binding growth factors from bovine, porcine and  
 RL canine hearts.";  
 RL Eur. J. Biochem. 181:67-73(1989).  
 RN [9]  
 RP SEQUENCE OF 1-18 FROM N.A.  
 RA Philippe J.M., Renaud F., Desset S., Laurent M.;  
 RL Submitted (JUL-1992) to the EMBL/GenBank/DBJ databases.  
 RN [10]  
 RP X-RAY CRYSTALLOGRAPHY (3.0 ANGSTROMS).  
 RX MEDLINE; 91095983.  
 RA Zhu X., Komiya H., Chirino A., Faham S., Fox G.M., Arakawa T.,  
 RA Hsu B.T., Rees D.C.;  
 RT "Three-dimensional structures of acidic and basic fibroblast growth  
 RT factors.";  
 RL Science 251:90-93(1991).  
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
 CC -!- SUBUNIT: MONOMER.





[illegible]





SQ SEQUENCE 155 AA; 17250 MW; BE6CE70FA6107129 CRC64;  
Query Match 26.18; Score 516; DB 1; Length 155;  
Best Local Similarity 55.28; Pred. No. 1.14e-87;  
Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;  
Db 24 GHFKDPKRLXCKNGGFFLRHPDGRVDRKSDPHIKLQLOAEERGVSIGVCANRYL 83  
QY 147 ANYKKPKLLXCSNGGHFLRLPDGTDRSDQHQIQLQLSAESVGEVYIKSTETGQYL 206  
Db 84 AMKEDGRLLASKVDCFFERLESNNYTYRSKYS--SWTVALKRTQYKLGSKTGP 141  
QY 207 AMDTDGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPRTHY 266  
Db 142 GOKAILFLPMSAKS 155  
QY 267 GOKAILFLPLPVSS 280  
RESULT 13  
FCF2 RAT STANDARD; PRT; 154 AA.  
P3109;  
01-JAN-1990 (Rel. 13, Created)  
DT 01-JAN-1990 (Rel. 13, Last sequence update)  
DT 15-JUL-1998 (Rel. 36, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST  
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).  
GN FGF2 OR FGF-2.  
OS Rattus norvegicus (Rat).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.  
RN [1]  
RP SEQUENCE FROM N.A.  
RC STRAIN=SPRAGUE-DAWLEY; TISSUE=OVARY;  
RX MEDLINE; 89061721.  
RA Shimaseki S., Emoto N., Koba A., Mercado M., Shibata F.,  
RA Coakley K., Baird A., Ling N.;  
RT "Complementary DNA cloning and sequencing of rat ovarian basic  
RT fibroblast growth factor and tissue distribution study of its mRNA.";  
RL Biochem. Biophys. Res. Commun. 157:256-263(1988).  
RN [2]  
RP SEQUENCE FROM N.A.  
RC TISSUE=BRIN;  
RX MEDLINE; 88262516.  
RA Kurokawa T., Seno M., Igarashi K.;  
RT "Nucleotide sequence of rat basic fibroblast growth factor cDNA.";  
RL Nucleic Acids Res. 16:5201-5201(1988).  
RN [3]  
RP SEQUENCE OF 1-28 FROM N.A.  
RC STRAIN=SPRAGUE-DAWLEY; TISSUE=TESTIS;  
RX MEDLINE; 97200905.  
RA Pasumarthi K.B.S., Jin Y., Cattini P.A.;  
RT "Cloning of the rat fibroblast growth factor-2 promoter region and  
RT its response to mitogenic stimuli in glioma C6 cells.";  
RL J. Neurochem. 68:898-908(1997).  
RN [4]  
RP SEQUENCE OF 35-154 FROM N.A.  
RC STRAIN=SPRAGUE-DAWLEY; TISSUE=BRIN;  
RX MEDLINE; 92329546.  
RA El-Husseini A.E.D., Paterson J.A., Myal Y., Shiu R.P.C.;  
RT "PCR detection of the rat brain basic fibroblast growth factor (bFGF)  
RT mRNA containing a unique 3' untranslated region.";  
RL Biochem. Biophys. Acta 1131:314-316(1992).  
CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -1- SUBUNIT: MONOMER.  
CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES  
CC AFGF.  
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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CC  
CC EMBL; M22427; AAA41210.1; -  
CC EMBL; X07285; CAA30265.1; -  
CC EMBL; U78079; AAC53225.1; -  
CC EMBL; X61697; CAA43863.1; -  
CC PIR; S00876; S00876.  
CC PIR; A31674; A31674.  
CC HSSP; P09038; 1BFF.  
CC PFAM; PF00167; FGF; 1.  
CC PRINTS; PR00262; ILIHBGF.  
CC PRINTS; PR00263; HBGF.FGF.  
CC PROSITE; PS00247; HBGF.FGF; 1.  
KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
FT PROPEP 1  
FT CHAIN 10 154 HEPARIN-BINDING GROWTH FACTOR 2.  
FT BINDING 26 30 HEPARIN (POTENTIAL).  
FT BINDING 115 118 HEPARIN (POTENTIAL).  
SQ SEQUENCE 154 AA; 17139 MW; 1A0F14FF423D8403 CRC64;  
Query Match 25.78; Score 508; DB 1; Length 154;  
Best Local Similarity 54.5%; Pred. No. 7.91e-86;  
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;  
Db 23 GHFKDPKRLXCKNGGFFLRHPDGRVDRKSDPHIKLQLOAEERGVSIGVCANRYL 82  
QY 147 ANYKKPKLLXCSNGGHFLRLPDGTDRSDQHQIQLQLSAESVGEVYIKSTETGQYL 206  
Db 83 AMKEDGRLLASKVDCFFERLESNNYTYRSKYS--SWTVALKRTQYKLGSKTGP 140  
QY 207 AMDTDGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPRTHY 266  
Db 141 GOKAILFLPMSAKS 154  
QY 267 GOKAILFLPLPVSS 280  
RESULT 14  
ID FGF2 MOUSE STANDARD; PRT; 154 AA.  
AC P15655;  
DT 01-APR-1990 (Rel. 14, Created)  
DT 01-APR-1990 (Rel. 14, Last sequence update)  
DT 01-FEB-1996 (Rel. 33, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST  
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).  
GN FGF2 OR FGF-2.  
OS Mus musculus (Mouse).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.  
RN [1]  
RP SEQUENCE FROM N.A.  
RX MEDLINE; 90201563.  
RA Hebert J.M., Basilio C., Goldfarb M., Haub O., Martin G.R.;  
RT "Isolation of cDNAs encoding four mouse FGF family members and  
RT characterization of their expression patterns during embryogenesis.";  
RL Dev. Biol. 138:454-463(1990).  
CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -1- SUBUNIT: MONOMER.  
CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES  
CC AFGF.  
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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Science 251:90-93(1991).  
[14]  
RN STRUCTURE BY NMR.  
RX MEDLINE; 97040521.  
RA Moy F.J., Seddon A.P., Boehlen P., Powers R.:  
RT "High-resolution solution structure of basic fibroblast growth factor  
RT determined by multidimensional heteronuclear magnetic resonance  
RT spectroscopy".  
RL Biochemistry 35:13552-13561(1996).  
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -!- SUBUNIT: MONOMER.  
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES  
CC AFGF.  
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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CC  
CC EMBL; M17599; AAA52534.1; ALT\_INIT.  
DR EMBL; X04431; CAA28027.1; -  
DR EMBL; X04432; CAA28028.1; -  
DR EMBL; X04433; CAA28029.1; -  
DR EMBL; M27968; AAA52448.1; -  
DR EMBL; J04513; AAA52533.1; ALT\_INIT.  
DR PIR; A25824; A25824.  
DR PIR; A26642; A26642.  
DR PIR; B24243; B24243.  
DR PIR; B24301; B24301.  
DR PIR; B32878; B32878.  
DR PIR; S00297; S00297.  
DR PDB; 2FGF; 15-APR-92.  
DR PDB; 4FGF; 15-JUL-93.  
DR PDB; 1FGA; 15-JUL-93.  
DR PDB; 1BFB; 03-APR-96.  
DR PDB; 1BFC; 03-APR-96.  
DR PDB; 1BFF; 16-JUN-97.  
DR PDB; 1BFG; 31-JAN-94.  
DR PDB; 2BFG; 30-APR-94.  
DR PDB; 1BLA; 08-NOV-96.  
DR PDB; 1BLD; 08-NOV-96.  
DR MIM; 134920; -  
DR PFAM; PF00167; FGF; 1.  
DR PRINTS; PR00262; IL1HBGF.  
DR PRINTS; PR00263; HBGFEGF.  
DR PROSITE; PS00247; HBGF\_FGF; 1.  
KW Growth factor; Mitogen; Vascularization; Heparin-binding;  
FT PROPEP 1 9  
FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.  
FT SITE 46 48 CELL ATTACHMENT SITE (POTENTIAL).  
FT SITE 88 90 CELL ATTACHMENT SITE (POTENTIAL).  
FT BINDING 27 31 HEPARIN (POTENTIAL).  
FT BINDING 116 119 HEPARIN (POTENTIAL).  
FT STRAND 30 34 HEPARIN (POTENTIAL).  
FT TURN 35 38  
FT STRAND 39 43  
FT TURN 45 46  
FT STRAND 49 52  
FT TURN 55 56  
FT HELIX 58 60  
FT STRAND 62 66  
FT TURN 69 70  
FT STRAND 71 76  
FT TURN 77 80  
FT STRAND 81 85

FT TURN 87 88  
FT STRAND 91 94  
FT HELIX 99 101  
FT STRAND 103 107  
FT TURN 109 110  
FT STRAND 113 117  
FT TURN 121 122  
FT STRAND 124 124  
FT STRAND 127 127  
FT TURN 129 130  
FT STRAND 132 133  
FT HELIX 136 138  
FT TURN 141 142  
FT HELIX 144 146  
FT STRAND 148 152  
SQ SEQUENCE 155 AA; 17254 MW; B6CE13373007129 CRC64;  
  
Query Match 25.7%; Score 509; DB 1; Length 155;  
Best Local Similarity 54.5%; Pred. No. 4.66e-86;  
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;  
  
Db 24 GHFKDPKLYCKNGGFFLRHPDGRVDGVREKSDPHILQLQAEERGVSINKVCANRYL 83  
QY 147 ANYKKPLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLLSAESVGEYIYKSTETGQYL 206  
  
Db 84 AMKEDGRLLASKCVTDECFERLESNNYNTYRSRY--SWYVALKRTGYKLGSKTGP 141  
QY 207 AMDTGLLYGSQTPNEECLFLERLEENHYNTYISKHAEKNWFVLKKNKSGCKRGPRTHY 266  
  
Db 142 GKAILFLPMSAKS 155  
QY 267 GKAILFLPLPVSS 280

Search completed: Tue Aug 29 16:01:25 2000  
Job time : 28 secs.

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\*\*\*\*\* (TM)  
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MPsrch\_pp protein - protein database search, using Smith-Waterman algorithm  
on: Tue Aug 29 16:01:42 2000; MasPar time 23.63 Seconds  
824.524 Million cell updates/sec  
Tabular output not generated.  
Title: US-09-121-017B-23  
Description: (1-281) from US09121017B.pep  
Perfect Score: 1980  
Sequence: 1 MAPARFALLFFVGGVAES.....PRTHYGOKAILFLPLPVSSD 281  
Scoring table: PAM 150  
Gap 11  
Searched: 225878 seqs, 69334122 residues  
Post-processing: Minimum Match 0%  
Listing first 45 summaries  
Database: sptrmb112  
1:sp\_archaea 2:sp\_bacteria 3:sp\_fungi 4:sp\_human  
5:sp\_invertebrate 6:sp\_mammal 7:sp\_mhc 8:sp\_organelle  
9:sp\_phase 10:sp\_plant 11:sp\_rodent 12:sp\_unclassified  
13:sp\_vertebrate 14:sp\_virus  
Statistics: Mean 46.003; Variance 77.721; scale 0.592  
Pred. No. is the number of results predicted by chance to have a  
score greater than or equal to the score of the result being printed,  
and is derived by analysis of the total score distribution.

Result No.	Score	Query Match	Length	ID	Description	Pred. No.
1	642	32.4	198	11	RYUDOCAN CORE PROTEIN	1.22e-119
2	511	25.8	130	6	BASIC FIBROBLAST GROWTH	1.43e-88
3	509	25.7	196	4	21 KD BASIC FIBROBLAST	4.36e-88
4	382	19.3	101	13	BASIC EGF (FRAGMENT)	1.07e-58
5	346	17.5	146	13	FIBROBLAST GROWTH FACT	1.45e-50
6	313	15.8	115	11	BASIC FIBROBLAST GROWTH	3.24e-43
7	313	15.8	194	6	KERATINOCYTE GROWTH FA	3.24e-43
8	289	14.6	212	13	KERATINOCYTE GROWTH FA	5.98e-38
9	274	13.8	252	11	PHF-4b.	1.07e-34
10	265	13.4	60	4	ACIDIC FIBROBLAST GROW	9.24e-33
11	265	13.4	70	11	FIBROBLAST GROWTH FACT	9.24e-33
12	264	13.3	59	4	ACIDIC FIBROBLAST GROW	1.51e-32
13	260	13.1	196	13	POTATIVE FIBROBLAST GR	1.09e-31
14	257	13.0	243	13	FIBROBLAST GROWTH FACT	4.74e-31
15	251	12.7	127	4	FIBROBLAST GROWTH FACT	8.94e-30
16	250	12.6	206	13	FIBROBLAST GROWTH FACT	1.46e-29
17	248	12.5	192	4	FIBROBLAST GROWTH FACT	3.86e-29
18	248	12.5	245	13	FIBROBLAST GROWTH FACT	3.86e-29
19	236	11.9	200	13	FIBROBLAST GROWTH FACT	1.29e-26
20	225	11.4	74	6	KERATINOCYTE GROWTH FA	2.51e-24

21	226	11.4	425	5	076831	LET-756 PROTEIN.	1.56e-24
22	223	11.3	204	13	090696	FIBROBLAST GROWTH FACT	6.50e-24
23	222	11.2	204	13	057341	FIBROBLAST GROWTH FACT	1.05e-23
24	217	11.0	770	5	P91672	EGF HOMOLOG.	1.12e-22
25	213	10.8	244	4	Q14915	FIBROBLAST GROWTH FACT	7.35e-22
26	209	10.6	210	13	042278	FIBROBLAST GROWTH FACT	4.79e-21
27	207	10.5	129	4	060371	R33683.2.	1.22e-20
28	199	10.1	285	14	Q9YMH2	FIBROBLAST GROWTH FACT	4.99e-19
29	198	10.0	182	14	092401	EGF-ACMNPV ORF32.	7.92e-19
30	187	9.4	216	4	095750	EGF-19.	7.21e-16
31	183	9.2	73	6	097573	FIBROBLAST GROWTH FACT	7.36e-16
32	181	9.1	114	4	Q16443	BASIC FIBROBLAST GROW	1.81e-15
33	181	9.1	114	4	000527	BASIC FIBROBLAST GROW	1.81e-15
34	157	7.9	78	11	035340	FIBROBLAST GROWTH FACT	6.73e-11
35	120	6.1	384	2	007819	CYTOCHROME.	2.14e-04
36	116	5.9	82	6	062682	FIBROBLAST GROWTH FACT	9.58e-04
37	112	5.7	86	13	P79685	FIBROBLAST GROWTH FACT	4.18e-03
38	108	5.5	375	11	088701	NUCLEOSOME ASSEMBLY PR	1.75e-02
39	106	5.4	507	2	Q92EP3	SENSORY HISTIDINE KINA	3.54e-02
40	106	5.4	2607	5	Q23187	W06A7.3A PROTEIN.	3.54e-02
41	105	5.3	193	5	076215	DENSE GRANULE PROTEIN.	5.02e-02
42	102	5.2	239	2	069564	POTATIVE LIPOPROTEIN.	1.41e-01
43	102	5.2	243	14	073554	HYPOTHETICAL 27.5 KD P	1.41e-01
44	103	5.2	837	5	Q25751	A332 ANTIGEN (FRAGMENT	1.00e-01
45	101	5.1	822	1	027154	CONSERVED PROTEIN.	1.99e-01

ALIGNMENTS

RESULT 1	PRELIMINARY;	PRT;	198 AA.
ID O35988			
AC O35988:			
DT 01-JAN-1998 (TRENBLrel. 05, Created)			
DT 01-JAN-1998 (TRENBLrel. 05, Last sequence update)			
DT 01-NOV-1999 (TRENBLrel. 12, Last annotation update)			
DE RYUDOCAN CORE PROTEIN PRECURSOR.			
OS Mus musculus (Mouse).			
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;			
OC Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.			
RN [1]			
RP SEQUENCE FROM N.A.			
RC STRAIN=C3H/AN, AND 129SVJ;			
RX MEDLINE; 97420681.			
RA TSUZUKI S., KOJIMA T., KATSUMI A., YAMAZAKI T., SUGIURA I., SAITO H.;			
RT "Molecular cloning, genomic organization, promoter activity, and			
RT tissue-specific expression of the mouse ryudocan gene.";			
RL J. Biochem. 122:17-24(1997).			
CC -!- FUNCTION: CELL SURFACE PROTEOGLYCAN THAT BEARS BOTH HEPARAN			
CC SULFATE AND CHONDROITIN SULFATE AND THAT LINKS THE CYTOSKELETON TO			
CC THE INTERSTITIAL MATRIX. BINDS BASIC FIBROBLAST GROWTH FACTOR.			
DR EMBL; D89571; BAA22135.1; -.			
DR EMBL; D89572; BAA22136.1; -.			
DR PROSITE; PS00964; SYNDSCAN; 1.			
KW PFAM; PF01034; Syndcan; 1.			
FT SIGNAL 1 23 POTENTIAL.			
FT CHAIN 24 198 POTENTIAL.			
SQ SEQUENCE 198 AA; 21482 MW; FC67B0E5 CRC32;			
Query Match 32.4%; Score 642; DB 11; Length 198;			
Best Local Similarity 73.5%; Pred. No. 1.22e-119;			
Matches 111; Conservative 16; Mismatches 14; Indels 10; Gaps 7;			
Db 1 MAPACILLAPLLLLGGPPLVPGESIRETEVIDPDLLEGYFSGALPDDEA-G-G--S 56			
QY 1 MAPARLFA-LLFFVGG---VA-ESIRETEVIDPDLLEGYFSGALPDDEVDVVGQES 55			
Db 57 DDFELSGGDLDDTEPRPFPEVIEPLVDNHPENAPQIRVSEPKLENEVIPKR 116			
QY 56 DDFELSGGDLDDLSGDMIGPEVHPVPLVDNHPERAGSGSQVTEPKKLENEVIPKR 115			
Db 117 -APSDVGDDMSNKVSMSSSTAOGSNIFERTEV 146			





150 KRPKLLYCSNGGHFLRLPDGTVGTRSDQHIQLSAESVGEVYIKSTETGQYLAND 209  
140 KRGKVVSKFNSDKLRIENGNTYASLNWKHNGRQMFVALNGRQATRGKTRK 199  
210 TDGLQVSGTPEECFLERLEENHYNTYIS-K-KHAENWFWGLKNGSKCRGPRTHYG 267  
200 NTSAHFLPMVMS 212  
268 QRAILFLPLVSS 280

RESULT 9  
ID O89096 PRELIMINARY; PRT; 252 AA.  
AC O89096;  
DT 01-NOV-1998 (TREMBlrel. 08, Created)  
DT 01-NOV-1998 (TREMBlrel. 08, Last sequence update)  
DE FHF-4B.  
Rattus norvegicus (Rat), and Mus musculus (Mouse).  
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.  
[1]  
RP SEQUENCE FROM N.A.  
RC TISSUE-BRAIN;  
RX MEDLINE; 98267141.  
RA YAMAMOTO S., MIKAMI T., OHBAYASHI N., OHTA M., ITOH N.;  
"Structure and expression of a novel isoform of mouse FGF homologous  
factor (FHF)-4.";  
RL Biochim. Biophys. Acta 1398:38-41(1998).  
DR EMBL; AB008908; BAA31544.1; -  
DR EMBL; AB008907; BAA31543.1; -  
DR HSSP; P03968; 1BAR.  
DR PROSITE; PS00247; HGF\_FGF; 1.  
DR PFAM; PF00167; FGF; 1.  
SQ SEQUENCE 252 AA; 28364 MW; 1DFD5B4B CRC32;

Query Match 13.8%; Score 274; DB 11; Length 252;  
Best Local Similarity 37.5%; Pred. No. 1.07e-34;  
Matches 48; Conservative 26; Mismatches 49; Indels 5; Gaps 3;  
80 LYCRQG-YIQLMHPDGLDGTDDSTNLTFLNLPVGLRWAIQGVKTGLYIAMNGEYL 138  
155 LYCSNGGHFLRLPDGTVGTRSDQHIQLSAESVGEVYIKSTETGQYLANDTDGLL 214  
139 YPELTPPECKFKESVFNYYIYSMLTRQESGRANFLGNKEQVMKGRVKKTKPA 198  
215 YGSGTPEECFLERLEENHYNTYISK-KHAE--KNWFWGLKNGSKCRGPRTHYGQRA 270  
199 AHFLPKPL 206  
271 ILFLPLV 278

RESULT 10  
ID Q16588 PRELIMINARY; PRT; 60 AA.  
AC Q16588;  
DT 01-NOV-1996 (TREMBlrel. 01, Created)  
DT 01-NOV-1996 (TREMBlrel. 01, Last sequence update)  
DE ACIDIC FIBROBLAST GROWTH FACTOR (FRAGMENT).  
OS Homo sapiens (Human).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
Eutheria; Primates; Catarrhini; Hominidae; Homo.  
[1]  
RP SEQUENCE FROM N.A.  
RX MEDLINE; 94069734.  
RA ZHAO X.M., YEOH T.K., HIEBERT M., FRIST W.H., MILLER G.G.;  
"The expression of acidic fibroblast growth factor (heparin-binding  
growth factor-1) and cytokine genes in human cardiac allografts and T  
cells.";  
RL Transplantation 56:1177-1182(1993).  
DR

RP SEQUENCE FROM N.A.  
RX MEDLINE; 92202857.  
RA LI Y.L., KHA H., GOLDEN J.A., MICHELSEN A.A.J., GOETZL E.J.,  
TURCK E.J.;  
"An acidic fibroblast growth factor protein generated by alternate  
splicing acts like an antagonist.";  
RL J. Exp. Med. 175:1073-1080(1992).  
DR EMBL; S67292; AAB29058.1; -  
DR EMBL; X65779; CAA46662.1; -  
DR HSSP; P05230; 2AXM.  
DR PFAM; PF00167; FGF; 1.  
FT NON\_TER 60  
SQ SEQUENCE 60 AA; 6697 MW; 6CC7DFF CRC32;  
Query Match 13.4%; Score 265; DB 4; Length 60;  
Best Local Similarity 92.1%; Pred. No. 9.24e-33;  
Matches 35; Conservative 2; Mismatches 1; Indels 0; Gaps 0;  
21 GNYKKPKLLYCSNGGHFLRLPDGTVGTRSDQHIQ 58  
147 ANYKKPKLLYCSNGGHFLRLPDGTVGTRSDQHIQ 184

RESULT 11  
ID O54837 PRELIMINARY; PRT; 70 AA.  
AC O54837;  
DT 01-JUN-1998 (TREMBlrel. 06, Created)  
DT 01-JUN-1998 (TREMBlrel. 06, Last sequence update)  
DE FIBROBLAST GROWTH FACTOR-1 (FRAGMENT).  
OS Mus musculus (Mouse).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.  
[1]  
RP SEQUENCE FROM N.A.  
RC STRAIN=C3H/HEN; TISSUE=LIVER;  
RA ZHANG Y.-X., HACKSHAW K.V.;  
Submitted (JUL-1997) to the EMBL/GenBank/DBJ databases.  
DR EMBL; AF012926; AAB94020.1; -  
DR HSSP; P05230; 2AXM.  
DR PFAM; PF00167; FGF; 1.  
FT NON\_TER 70  
SQ SEQUENCE 70 AA; 7677 MW; 15A1BE5E CRC32;

Query Match 13.4%; Score 265; DB 11; Length 70;  
Best Local Similarity 94.6%; Pred. No. 9.24e-33;  
Matches 35; Conservative 2; Mismatches 0; Indels 0; Gaps 0;  
34 LGNYKKPKLLYCSNGGHFLRLPDGTVGTRSDQH 70  
146 VANYKKPKLLYCSNGGHFLRLPDGTVGTRSDQH 182

RESULT 12  
ID Q16089 PRELIMINARY; PRT; 59 AA.  
AC Q16089;  
DT 01-NOV-1996 (TREMBlrel. 01, Created)  
DT 01-NOV-1996 (TREMBlrel. 01, Last sequence update)  
DE ACIDIC FIBROBLAST GROWTH FACTOR (FRAGMENT).  
OS Homo sapiens (Human).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
Eutheria; Primates; Catarrhini; Hominidae; Homo.  
[1]  
RP SEQUENCE FROM N.A.  
RX MEDLINE; 94069734.  
RA ZHAO X.M., YEOH T.K., HIEBERT M., FRIST W.H., MILLER G.G.;  
"The expression of acidic fibroblast growth factor (heparin-binding  
growth factor-1) and cytokine genes in human cardiac allografts and T  
cells.";  
RL Transplantation 56:1177-1182(1993).  
DR EMBL; S67294; AAB29059.1; -  
DR HSSP; P05230; 2AXM.



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DR PFAM; PF00167; FGF; 1.
FT NON_TER 59
SQ SEQUENCE 59 AA; 6595 MW; 1C932B1D CRC32;

Query Match 13.3%; Score 264; DB 4; Length 59;
Best Local Similarity 97.2%; Pred. No. 1.51e-32;
Matches 35; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 21 GNYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQH 56
QY 147 ANYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQH 182

RESULT 13
ID Q9YH31 PRELIMINARY; PRT; 196 AA.
AC Q9YH31;
DT 01-MAY-1999 (Tremblrel. 10, Created)
DT 01-MAY-1999 (Tremblrel. 10, Last sequence update)
DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)
PUTATIVE FIBROBLAST GROWTH FACTOR-4.
Notophthalmus viridescens (Eastern newt) (Triturus viridescens).
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Amphibia;
OC Batrachia; Caudata; Salamandroidea; Salamandridae; Notophthalmus.
RN [1]
RP SEQUENCE FROM N.A.
RA WEI Y.;
RT "Putative Newt Fibroblast Growth Factor-4."
RL Submitted (OCT-1996) to the EMBL/GenBank/DBJ databases.
DR EMBL; U76998; AAC98812.1; -.
DR HSP; P09038; IBFF.
DR PROSITE; PS00247; HBGF_FGF; 1.
SQ SEQUENCE 196 AA; 22033 MW; 455E08A3 CRC32;

Query Match 13.1%; Score 260; DB 13; Length 196;
Best Local Similarity 34.6%; Pred. No. 1.09e-31;
Matches 44; Conservative 31; Mismatches 48; Indels 4; Gaps 3;

Db 71 KRRLRYCNVGIHFGLVLPDGRIGRMSES--RYSLSISPVGVGVGQSLFLAM 129
QY 150 KPKLLYCSNGGHF-LRLPDGTVGTRDRSDQHQLQLSAESVGEVIKSTETQOYLAM 208

Db 130 NSKGRFGSKYFSDCKEMLLPNYNAYESWRYPGM--YIALSKNGRAKNGKVSPTM 187
QY 209 DTGGLLYSGTQNEECFLERLEENHYNTIYISKKAERNWFVGLKNGSKRGPRTHYGO 268

Db 188 TVTHFLP 194
269 KAILELP 275

RESULT 14
ID Q9W6A1 PRELIMINARY; PRT; 243 AA.
AC Q9W6A1;
DT 01-NOV-1999 (Tremblrel. 12, Created)
DT 01-NOV-1999 (Tremblrel. 12, Last sequence update)
DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)
DE FIBROBLAST GROWTH FACTOR 12 ISOFORM A.
GN FGF12.
OS Gallus gallus (Chicken).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;
OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.
RN [1]
RP SEQUENCE FROM N.A.
RA MEDLINE; 99065510.
RA MUNOZ-SANJUAN I., SIMANDL B.K., FALLON J.F., NATHANS J.;
RT "Expression of chicken fibroblast growth factor homologous factor
(FHF)-1 and of differentially spliced isoforms of FHF-2 during
development and involvement of FHF-2 in chicken limb development."
RL Development 126:409-421(1999).
DR EMBL; AF108754; AAD21575.1; -.
DR PROSITE; PS00247; HBGF_FGF; 1.
SQ SEQUENCE 243 AA; 27455 MW; A9E68CD CRC32;

Query Match 13.0%; Score 257; DB 13; Length 243;
Best Local Similarity 34.4%; Pred. No. 4.74e-31;
Matches 44; Conservative 31; Mismatches 48; Indels 5; Gaps 3;

Db 77 LF-SQOYFIQMHDPDGTIDGTYKDNSDYTLNLPVGLRVVAIOGVKASLYVAMNGEYL 135
QY 155 LYCSNGGHFLRLPDGTVGTRDRSDQHQLQLSAESVGEVIKSTETQOYLAMDIDGLL 214

Db 136 YSSDVFTEPECKFESVPENYYVYSSITLYROESGRAFLGNKEGOIMKGNVKKTRPS 195
QY 215 YGSQTPNEECFLERLEENHYNTIYISK--KHAE--KNWFVGLKNGSKRGPRTHYGO 270

Db 196 SHFVPKPI 203
QY 271 ILFLPLPV 278

RESULT 15
ID Q99517 PRELIMINARY; PRT; 127 AA.
AC Q99517;
DT 01-MAY-1997 (Tremblrel. 03, Created)
DT 01-MAY-1997 (Tremblrel. 03, Last sequence update)
DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)
DE FIBROBLAST GROWTH FACTOR 12 (FRAGMENT).
GN FGF12.
OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Primates; Catarrhini; Hominidae; Homo.
RN [1]
RP SEQUENCE FROM N.A.
RA COULIER F., PONTAROTTI P., ROUBIN R., HARTUNG H., GOLDFARB M.,
RA BIRNBAUM D.;
RL J. Mol. Evol. 0:0-0(0).
DR EMBL; Z70276; CA94240.1; -.
DR HSP; P03968; IAFc.
DR PROSITE; PS00247; HBGF_FGF; 1.
DR PFAM; PF00167; FGF; 1.
FT NON_TER 1 127
FT NON_TER 127 127
SQ SEQUENCE 127 AA; 14478 MW; 10E2842D CRC32;

Query Match 12.7%; Score 251; DB 4; Length 127;
Best Local Similarity 34.6%; Pred. No. 8.94e-30;
Matches 44; Conservative 30; Mismatches 48; Indels 5; Gaps 3;

Db 2 LF-SQOYFIQMHDPDGTIDGTYKDNSDYTLNLPVGLRVVAIOGVKASLYVAMNGEYL 60
QY 155 LYCSNGGHFLRLPDGTVGTRDRSDQHQLQLSAESVGEVIKSTETQOYLAMDIDGLL 214

Db 61 YSSDVFTEPECKFESVPENYYVYSSITLYROESGRAFLGNKEGOIMKGNVKKTRPS 120
QY 215 YGSQTPNEECFLERLEENHYNTIYISK--KHAE--KNWFVGLKNGSKRGPRTHYGO 270

Db 121 SHFVPKP 127
QY 271 ILFLPLP 277

Search completed: Tue Aug 29 16:04:20 2000
Job time : 158 secs.
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(MT)

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MParch_pp      protein - protein database search, using Smith-Waterman algorithm
               on:      Tue Aug 29 16:09:47 2000;  MasPar time 6.86 Seconds
               593.829 Million cell updates/sec
               Regular output not generated.

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Result No.	Query		DB	ID	Description	Pred. No.
	Score	Match				
1	985	79.3	140	R25914	Human acidic fibroblasts	2.79e-87
2	985	79.3	140	R34497	Human acidic fibroblasts	2.79e-87
3	985	79.3	140	P930068	Human acid fibroblast	2.79e-87
4	985	79.3	140	R74647	Human recombinant aFGF	2.79e-87
5	985	79.3	140	W04806	Human acidic fibroblasts	2.79e-87
6	985	79.3	140	P70995	Sequence of human prot	2.79e-87
7	985	79.3	141	R10527	Human acidic fibroblasts	2.79e-87
8	985	79.3	151	R05789	Human aFGF encoded by	2.79e-87
9	985	79.3	154	W32803	Human beta-endothelial	2.79e-87
10	985	79.3	154	W04805	Human beta-endothelial	2.79e-87
11	985	79.3	154	W06816	Human endothelial cell	2.79e-87
12	985	79.3	154	W75414	Human beta-endothelial	2.79e-87
13	985	79.3	155	P94037	Human acidic fibroblasts	2.79e-87
14	985	79.3	155	P70812	FGF-1	2.79e-87
15	985	79.3	155	P70482	Sequence encoded by co	2.79e-87
16	985	79.3	155	R80776	Fibroblast growth fact	2.79e-87
17	985	79.3	155	W53022	Fibroblast growth fact	2.79e-87
18	985	79.3	155	W75711	Fibroblast growth fact	2.79e-87
19	985	79.3	155	W75415	Human endothelial cell	2.79e-87
20	985	79.3	155	W92291	Human endothelial cell	2.79e-87
21	985	79.3	165	R05785	Human BECG encoded by	2.79e-87
22	985	79.3	168	W06818	Human endothelial cell	2.79e-87
23	985	79.3	134	W75413	Human alpha-endothelial	4.48e-87

QY 157 YGOKAILFLPLPVSSD 172

# RESULT 2

ID R34497; standard; protein; 140 AA.  
 AC R34497;  
 DT 06-AUG-1993 (first entry)  
 DE Human acidic fibroblast growth factor.  
 KW aFGF; muten; glycosylation site; glycoprotein.  
 OS Homo sapiens.  
 PN J050763356-A.  
 PD 30-MAR-1993.  
 PF 30-MAY-1991; 127435.  
 PR 31-MAY-1990; JP-143388.  
 PA (TAKE ) TAKEDA CHEM IND LTD.  
 DR WPI; 93-139564/17.  
 PT FGF muten prep. useful for therapy of burn or thrombosis - by transformation of lymphocyte-contained animal cell by vector contg. DNA encoding FGF muten.  
 BT Disclosure; Page 3; 23pp; Japanese.  
 CC The invention covers mutants of FGF (esp. bFGF) which contain at least one glycosylation site. The muten can be used to treat burns and thrombosis.  
 SQ Sequence 140 AA;

Query Match 79.3%; Score 985; DB 1; Length 140;  
 Best Local Similarity 98.5%; Pred. No. 2.79e-87;  
 Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;

Db 5 PGNYPKPLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQY 64

QY 37 SANYKKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQY 96

Db 65 LAMDTDGLLYGSQTPNEECFLERLEENHNTYISKHAEKNWFVGLKNGSKCKRGPRTH 124

QY 97 LAMDTDGLLYGSQTPNEECFLERLEENHNTYISKHAEKNWFVGLKNGSKCKRGPRTH 156

Db 125 YGOKAILFLPLPVSSD 140

QY 157 YGOKAILFLPLPVSSD 172

RESULT 3

ID P90068 standard; protein; 140 AA.  
 AC P90068;  
 DT 1-NOV-1989 (first entry)  
 DE Human acidic fibroblast growth factor  
 KW Human acidic fibroblast growth factor; mutant.  
 OS Homo sapiens  
 PN EP-319052-A.  
 PD 14-JUN-1989.  
 PF 14-OCT-1988; 202306.  
 PR 22-OCT-1987; EP-244431.  
 PA (MERI) Merck and Co.  
 PI Thomas Jnr KA, Linemeyer DL;  
 DR WPI; 89-167092/23.  
 PT Mutant acidic fibroblast growth factor  
 BT - used for promoting repair of soft tissue, musculoskeletal tissue or vascular or nerve tissue and plasminogen activator prodn.  
 CC Disclosure; page 4; 36pp; English.  
 CC Amino acid sequence of human acidic fibroblast growth factor (aFGF). The patent claims mutant forms which have increased biological activity with(out) heparin, and promote cell growth.  
 SQ Sequence 140 AA;

Query Match 79.3%; Score 985; DB 1; Length 140;  
 Best Local Similarity 98.5%; Pred. No. 2.79e-87;  
 Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;

Db PGNYPKPLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQY 64

QY 37 SANYKKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQY 96

Db 65 LAMDTDGLLYGSQTPNEECFLERLEENHNTYISKHAEKNWFVGLKNGSKCKRGPRTH 124

QY 97 LAMDTDGLLYGSQTPNEECFLERLEENHNTYISKHAEKNWFVGLKNGSKCKRGPRTH 156

QY 37 SANYKKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQY 96

Db 65 LAMDTDGLLYGSQTPNEECFLERLEENHNTYISKHAEKNWFVGLKNGSKCKRGPRTH 124

QY 97 LAMDTDGLLYGSQTPNEECFLERLEENHNTYISKHAEKNWFVGLKNGSKCKRGPRTH 156

Db 125 YGOKAILFLPLPVSSD 140

QY 157 YGOKAILFLPLPVSSD 172

RESULT 4

ID R74547 standard; protein; 140 AA.  
 AC R74547;  
 DT 25-SEP-1995 (first entry)  
 DE Human recombinant aFGF.  
 KW Acidic fibroblast growth factor; aFGF; vulnery; angiogenesis; mitogen.  
 OS Homo sapiens.  
 PN US5401832-A.  
 PD 28-MAR-1995.  
 PF 24-DEC-1984; 685923.  
 PR 24-DEC-1984; US-685923.  
 PR 12-SEP-1985; US-774359.  
 PR 30-MAY-1986; US-868473.  
 PR 11-JUL-1985; US-884460.  
 PR 04-JUN-1987; US-054991.  
 PR 04-MAY-1988; US-190293.  
 PR 08-FEB-1991; US-654397.  
 PR 25-SEP-1991; US-765472.  
 PR 25-SEP-1992; US-951365.  
 PA (MERI) MERCK & CO INC.  
 PI Gimenez-Gallego G, Kelly LJ, Linemeyer DL, Thomas KA;  
 DR WPI; 95-138983/18.  
 PT New recombinant human acidic fibroblast growth factor - used to promote cell growth, to promote wound healing, for vascular grafts and blood vessel repair  
 PT Claim 2; Column 30; 25pp; English.  
 CC Oligonucleotides were synthesized on the basis of the amino acid sequence of bovine acidic fibroblast growth factor (aFGF) and used to produce a synthetic gene (given in Q88233) incorporating codons preferred by E. coli or mammalian cells, unique cloning sites, etc. This synthetic gene was mutagenized to obtain a gene encoding a human recombinant aFGF (R74647) having activity equivalent to the native protein.  
 SQ Sequence 140 AA;

Query Match 79.3%; Score 985; DB 1; Length 140;  
 Best Local Similarity 98.5%; Pred. No. 2.79e-87;  
 Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;

Db 5 PGNYPKPLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQY 64

QY 37 SANYKKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQY 96

Db 65 LAMDTDGLLYGSQTPNEECFLERLEENHNTYISKHAEKNWFVGLKNGSKCKRGPRTH 124

QY 97 LAMDTDGLLYGSQTPNEECFLERLEENHNTYISKHAEKNWFVGLKNGSKCKRGPRTH 156

Db 125 YGOKAILFLPLPVSSD 140

QY 157 YGOKAILFLPLPVSSD 172

RESULT 5

ID W04806 standard; protein; 140 AA.  
 AC W04806;  
 DT 29-DEC-1996 (first entry)  
 DE Human acidic fibroblast growth factor.  
 KW Endothelial cell growth factor; ECGF; blood vessel; regeneration; heparin-Sepharose affinity chromatography; probe; oligonucleotide;  
 OS Homo sapiens.

Query Match 79.38; Score 985; DB 1: Length 140;

Query Match	79.3%	Score 985;	DB 1;	Length 141;
Best Local Similarity	98.5%;	Pred. No. 2.79e-87;		
Matches 134;	Conservative 2;	Mismatches 0;	Indels 0;	Gaps
Db	6	PGNVKPKLLKLYCSNGGHFRLIPDGTVDCTDRSDQHLOLQLSAHSVGEVYIKSTETGQY	65	
QY	37	SANYKPKLLKLYCSNGGHFRLIPDGTVDCTDRSDQHLOLQLSAHSVGEVYIKSTETGQY	96	
Db	66	LAMDTDGLLYGSQTPNEECFLERLEENHYNTIYISKKHAEKNWFVLKKNKSGCKRGPTTH	125	
QY	97	LAMDTDGLLYGSQTPNEECFLERLEENHYNTIYISKKHAEKNWFVLKKNKSGCKRGFRTH	156	
Db	126	YGOKAILFPLPVSSD	141	
QY	157	YGOKAILFPLPVSSD	172	

## RESULT

ID R05789 standard; Protein; 151 AA.  
AC R05789;  
DT 22-AUG-1990 (first entry)  
DE Human aFGF encoded by synthetic gene.  
KW Acidic fibroblast growth factor; aFGF; thrombogenesis;  
KW atherosclerosis; tumors.  
OS Synthetic.  
FH Key Location/Qualifiers  
FT misc\_difference 146..147  
FT /note="sites corresp. to two stop codons of  
FT the DNA sequence"  
PN GB2223496-A.  
PD 11-APR-1990.  
PF 08-AUG-1988; 018775.  
PR 08-AUG-1988; GB-018775.  
PA (BRBI-) Brit Bio-Tech Ltd.  
PI Davies JA, Johnson ID;  
DR WPI: 90-109882/15.  
DR N-PSDB; Q03873.  
DE Gene encoding human acidic fibroblast growth factor -  
incorporates useful restriction sites at frequent intervals to  
facilitate cassette mutagenesis of specified regions.  
PS Claim 2; Fig 3a; 12pp; English.  
CC The synthetic aFGF gene incorporates useful restriction sites at  
frequent intervals to facilitate the cassette mutagenesis of  
selected regions. Also included are flanking sites to simplify  
CC the incorporation of the gene into any expression system.  
CC The aFGF mol. acts in a cascade effect to control endothelial cell  
activity either co-ordinately through synergistic effects or via  
independent routes. The regulation of endothelial cells is essential  
for the protection of arteries, veins and capillaries from the effect  
of thrombogenesis. Their stimulation and control by these factors is  
also thought to be important in the development of tumours and  
atherosclerosis.  
CC Sequence 151 AA;  
SQ

Query Match 79.3%; Score 985; DB 1; Length 151;  
Best Local Similarity 98.5%; Pred. No. 2.79e-87;  
Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;

Db 10 PGNYKKPKLLYCSNGGHFLRLPDGTGTRDRSDQHQLQLSAESVGEVYIKSTETGOY 69  
QY 37 SANYKKPKLLYCSNGGHFLRLPDGTGTRDRSDQHQLQLSAESVGEVYIKSTETGOY 96  
Db 70 LAMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCKRGPRTH 129  
QY 97 LAMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCKRGPRTH 156  
130 YGQKAILFLPLPVSSD 145  
157 YGQKAILFLPLPVSSD 172

RESULT 9  
ID W92283 standard; protein; 154 AA.  
AC W92283;  
DT 20-APR-1999 (first entry)  
DE Human beta-endothelial cell growth factor (ECGF) protein sequence.  
KW Endothelial cell growth factor; ECGF; cleavable; recombinant; repair;  
KW regenerate; blood vessel; endothelial cell; human.  
OS Homo sapiens.  
PN US5849538-A.  
PD 15-DEC-1998.  
PF 11-APR-1997; 840088.  
PR 04-NOV-1996; US-743261.  
PR 03-MAR-1986; US-835594.  
PR 18-DEC-1987; US-134499.  
PR 29-APR-1991; US-693079.  
PR 27-NOV-1991; US-799859.  
PR 03-NOV-1994; US-334884.  
PR 07-JUN-1995; US-472964.  
PR 11-APR-1997; US-840088.  
PA (RHON ) RHONE-POULENC RORER PHARM INC.

PI Burgess W, Drohan WN, Jaye M, Maciag T;  
DR WPI: 99-069734/06.  
DT DNA encoding a cleavable signal peptide and an endothelial cell  
PT growth factor - useful for producing recombinant endothelial cell  
PT growth factor proteins  
PS Claim 1; Column 16; 23pp; English.  
CC This represents the amino acid sequence of human beta-endothelial cell  
CC growth factor (ECGF). The invention is directed to DNA encoding alpha-  
CC or beta-ECGF and plasmids comprising the DNA sequences. The DNA encodes a  
CC cleavable signal peptide and an ECGF, where removal of the signal peptide  
CC yields a mature form of the ECGF. The DNA is used to produce recombinant  
CC ECGF proteins, which can be used in treatments to repair or regenerate  
CC blood vessels or other structures lined with endothelial cells.  
CC Sequence 154 AA;  
SQ

Query Match 79.3%; Score 985; DB 1; Length 154;  
Best Local Similarity 98.5%; Pred. No. 2.79e-87;  
Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;

Db 19 PGNYKKPKLLYCSNGGHFLRLPDGTGTRDRSDQHQLQLSAESVGEVYIKSTETGOY 78  
QY 37 SANYKKPKLLYCSNGGHFLRLPDGTGTRDRSDQHQLQLSAESVGEVYIKSTETGOY 96  
Db 79 LAMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCKRGPRTH 138  
QY 97 LAMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCKRGPRTH 156  
139 YGQKAILFLPLPVSSD 154  
157 YGQKAILFLPLPVSSD 172

RESULT 10  
ID W04805 standard; Protein; 154 AA.  
AC W04805;  
DT 29-DEC-1996 (first entry)  
DE Human beta-endothelial cell growth factor.  
KW Endothelial cell growth factor; ECGF; blood vessel; regeneration;  
KW heparin-Sepharose affinity chromatography; probe; oligonucleotide;  
KW EGF; fibroblast growth factor.  
OS Homo sapiens.  
PN US552528-A.  
PD 03-SEP-1996.  
PF 03-MAR-1986; 835594.  
PR 03-MAR-1986; US-835594.  
PR 18-DEC-1987; US-134499.  
PR 29-APR-1991; US-693079.  
PR 27-NOV-1991; US-799859.  
PR 03-NOV-1994; US-334884.  
PA (RHON ) RHONE-POULENC RORER PHARM INC.  
PI Burgess W, Maciag T;  
DR WPI: 96-412132/41.  
DR N-PSDB; T37503.  
DE Isolated, purified, biologically active bovine beta endothelial cell  
PT growth factor - useful to regenerate or treat damaged blood vessels  
PT Disclosure; Fig 8; 28pp; English.  
PS Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having  
CC a mol.wt. of 20 kD can be purified at least 16300 fold from bovine  
CC brain using heparin-Sepharose affinity chromatography. ECGF is  
CC useful for, among other purposes, diagnostic applications and has  
CC potential in the treatment of damaged blood vessels or other  
CC endothelial cell-lined structures.  
CC Human ECGF (T37503) or fragments may be obtained using  
CC oligonucleotides (T37504 and T37508 to T37509) whose design is based  
CC on the sequence of bovine alpha- and beta-ECGF.  
CC Sequence 154 AA;  
SQ

Query Match 79.3%; Score 985; DB 1; Length 154;  
Best Local Similarity 98.5%; Pred. No. 2.79e-87;  
Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;

Db 19 PGNYKKPKLLYCSNGGHFLRLPDGTGTRDRSDQHQLQLSAESVGEVYIKSTETGOY 78  
QY 37 SANYKKPKLLYCSNGGHFLRLPDGTGTRDRSDQHQLQLSAESVGEVYIKSTETGOY 96

QY 37 SANYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETGOY 96  
Db 79 LAMDTDGLLYGSOTPNEECFLERLEENHYNTYISKKAENKWFVGLKKNKSGCKRGPRTH 138  
QY 97 LAMDTDGLLYGSOTPNEECFLERLEENHYNTYISKKAENKWFVGLKKNKSGCKRGPRTH 156  
Db 139 YGOKAILFLPLPVSSD 154  
QY 157 YGOKAILFLPLPVSSD 172

## RESULT 11

ID W06816 standard; Protein; 154 AA.  
AC W06816;  
DT 17-MAR-1997 (first entry)  
DE Human endothelial cell growth factor-beta.  
KW Endothelial cell growth factor-beta; ECGF-beta.  
OS Homo sapiens.  
PN US5571790-A.  
PR 05-NOV-1996.  
QY 03-MAR-1986; 835594.  
PR 18-DEC-1987; US-835594.  
PR 29-APR-1991; US-693079.  
PR 27-NOV-1991; US-799859.  
PR 03-NOV-1994; US-334884.  
PR 07-JUN-1995; US-472964.  
PA (RHON) RHONE-POULENC RORER PHARM INC.  
PI Burgess W, Drohan WN, Jaye M, Maciag T;  
DR N-PSDB; T45983.  
PT Recombinant human endothelial cell growth factors - for treating  
PT damaged blood vessels, etc.  
PS Claim 1: Column 16: 22pp; English.  
CC Human recombinant endothelial cell growth factors (ECGF) beta  
CC (W06816) and alpha (W06817) differ only at their N-terminal ends.  
CC They can be produced in transformed prokaryotic or eukaryotic host  
CC cells using DNA sequences (T45983 and T45984, respectively) derived  
CC from the complete human ECGF cDNA (T45985). Large quantities of  
CC the ECGFs are produced by culturing the host cells and recovering  
CC the proteins. ECGFs have utility in the growth and amplification  
CC of endothelial cells in culture. They can potentially be used to  
CC treat damaged blood vessels and other endothelial cell-lined  
CC structures, and also have diagnostic applns.  
SQ Sequence 154 AA;

Query Match 79.3%; Score 985; DB 1; Length 154;  
Best Local Similarity 98.5%; Pred. No. 2,79e-87;  
Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;  
Db 19 PGNYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETGOY 78  
QY 37 SANYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETGOY 96  
Db 79 LAMDTDGLLYGSOTPNEECFLERLEENHYNTYISKKAENKWFVGLKKNKSGCKRGPRTH 138  
QY 97 LAMDTDGLLYGSOTPNEECFLERLEENHYNTYISKKAENKWFVGLKKNKSGCKRGPRTH 156  
Db 139 YGOKAILFLPLPVSSD 154  
QY 157 YGOKAILFLPLPVSSD 172

## RESULT 12

ID W75414 standard; Protein; 154 AA.  
AC W75414;  
DT 02-MAR-1999 (first entry)  
DE Human beta-endothelial cell growth factor.  
KW Human; endothelial cell growth factor; ECGF; brain stem; probe;  
KW hybridisation; bovine; wound healing; prosthetic device.  
OS Homo sapiens.  
PN US5827826-A.  
PR 27-OCT-1998.

## RESULT 13

ID P94037 standard; Protein; 155 AA.  
AC P94037;  
DT 25-JUN-1990 (first entry)  
DE Human acidic fibroblast growth factor.  
KW Acidic fibroblast growth factor.  
OS Homo sapiens.  
PN EP-298723-A.  
PR 11-JAN-1989.  
PR 06-JUL-1988; 306158.  
PR 07-JUL-1987; US-070797.  
PA (Biotec) Biotechn Res Assoc.  
PI Fiddes JC, Abraham JA, Protter A;  
DR WPI; 89-009785/02.  
DR N-PSDB; N93088.  
PT Recombinant DNA encoding new fibroblast growth factor  
PT analogues - useful eg for accelerating wound healing and  
PT to control neovascularisation.  
PS Disclosure; p: English.  
CC See also P94038.  
SQ Sequence 155 AA;

PF 04-NOV-1996; 743261.  
PR 04-NOV-1996; US-743261.  
PR 03-MAR-1986; US-835594.  
PR 18-DEC-1987; US-134499.  
PR 29-APR-1991; US-693079.  
PR 27-NOV-1991; US-799859.  
PR 03-NOV-1994; US-334884.  
PR 07-JUN-1995; US-472964.  
PA (RHON) RHONE-POULENC RORER PHARM INC.  
PI Burgess W, Drohan WN, Jaye M, Maciag T;  
DR WPI; 98-594032/50.  
PT Compositions for promoting wound healing - containing endothelial  
PT cell growth factor polypeptides  
PS Claim 1: Column 16: 23pp; English.  
CC This sequence represents the amino acid sequence of the mature human  
CC beta-endothelial cell growth factor (b-ECGF). This amino acid sequence  
CC is identical to the alpha-ECGF but the beta sequence contains an extra  
CC 20 N-terminal amino acids. The sequence was isolated from a human brain  
CC stem cell cDNA library using a probe designed based on fragments of the  
CC bovine ECGF (see W75416-W75418). The ECGF protein can be used in  
CC compositions for promoting wound healing. ECGF is also used to grow  
CC cells on a prosthetic device.  
SQ Sequence 154 AA;

Query Match 79.3%; Score 985; DB 1; Length 154;  
Best Local Similarity 98.5%; Pred. No. 2,79e-87;  
Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;  
Db 19 PGNYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETGOY 78  
QY 37 SANYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETGOY 96  
Db 79 LAMDTDGLLYGSOTPNEECFLERLEENHYNTYISKKAENKWFVGLKKNKSGCKRGPRTH 138  
QY 97 LAMDTDGLLYGSOTPNEECFLERLEENHYNTYISKKAENKWFVGLKKNKSGCKRGPRTH 156  
Db 139 YGOKAILFLPLPVSSD 154  
QY 157 YGOKAILFLPLPVSSD 172

## RESULT 14

ID P94037 standard; Protein; 155 AA.  
AC P94037;  
DT 25-JUN-1990 (first entry)  
DE Human acidic fibroblast growth factor.  
KW Acidic fibroblast growth factor.  
OS Homo sapiens.  
PN EP-298723-A.  
PR 11-JAN-1989.  
PR 06-JUL-1988; 306158.  
PR 07-JUL-1987; US-070797.  
PA (Biotec) Biotechn Res Assoc.  
PI Fiddes JC, Abraham JA, Protter A;  
DR WPI; 89-009785/02.  
DR N-PSDB; N93088.  
PT Recombinant DNA encoding new fibroblast growth factor  
PT analogues - useful eg for accelerating wound healing and  
PT to control neovascularisation.  
PS Disclosure; p: English.  
CC See also P94038.  
SQ Sequence 155 AA;

Query Match 79.3%; Score 985; DB 1; Length 155;  
Best Local Similarity 98.5%; Pred. No. 2,79e-87;  
Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;  
Db 20 PGNYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETGOY 79  
QY 37 SANYKKPKLLYCSNGGHLRLPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETGOY 96  
Db 80 LAMDTDGLLYGSOTPNEECFLERLEENHYNTYISKKAENKWFVGLKKNKSGCKRGPRTH 139

QY 97 LAMDTGGLLYGSQTPNEECFLERLEENHYNTYISKKAENKWFVGLKNGSKRGPRTH 156  
 Db 140 YGOKAILFLPLPVSSD 155  
 QY 157 YGOKAILFLPLPVSSD 172

## RESULT 14

ID R70812 standard; protein; 155 AA.  
 AC R70812; 1995 (first entry)  
 DT 01-SEP-1995  
 DE FGF-1.  
 KW FGF-1; fibroblast growth factor; cytotoxic conjugate; fusion protein;  
 KW saporin; cytostatic; tumor; diabetes; rheumatoid arthritis.  
 OS Homo sapiens. Location/Qualifiers  
 FH Key misc\_difference 31  
 FT misc\_difference 132  
 FT /note= "Cys may be replaced by Ser"  
 FT /note= "Cys may be replaced by Ser"  
 WO9503831-A.  
 09-FEB-1995.  
 PF 27-JUL-1994; U08511.  
 PR 02-AUG-1993; US-099924.  
 PR 29-OCT-1993; US-145829.  
 PA (PRIZ-) PRIZ PHARM INC.  
 PA (WHIT-) WHITIER INST DIABETES & ENDOCRINOLOGY.  
 FI Baird AJ, Iappi DA, Sosnowski BA;  
 DR WPI; 95-082038/11.  
 PT New monogenous preparations of cytotoxic conjugates and DNA -  
 PT contain fibroblast growth factors and cytotoxic agents for  
 PT treating FGF conditions such as tumours, diabetes and rheumatoid  
 PT arthritis.  
 PS Disclosure; Page 108-109; 128pp; English.  
 CC Novel fusion proteins comprise FGF linked to saporin. FGF-1 to -9  
 CC may be used, pref. FGF-1 (R70812), FGF-5 (R70813), FGF-7 (R70814) or  
 CC FGF-8 (R70815) muteins, in which at least 1 Cys residue is replaced  
 CC by conservative Ser substitutions. The fusion proteins are potent  
 CC cytotoxic agents to cells bearing the FGF receptor.  
 SQ Sequence 155 AA;

Query Match 79.3%; Score 985; DB 1; Length 155;  
 Best Local Similarity 98.5%; Pred. No. 2.79e-87;  
 Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;

Db 20 PGNKKPKLLYCSNGGHFLRILPDGTGTRDRSDQHIQLQLSAESVGEVYIKSTETGQY 79  
 37 SANYKKPKLLYCSNGGHFLRILPDGTGTRDRSDQHIQLQLSAESVGEVYIKSTETGQY 96  
 80 LAMDTGGLLYGSQTPNEECFLERLEENHYNTYISKKAENKWFVGLKNGSKRGPRTH 139  
 QY 97 LAMDTGGLLYGSQTPNEECFLERLEENHYNTYISKKAENKWFVGLKNGSKRGPRTH 156  
 Db 140 YGOKAILFLPLPVSSD 155  
 QY 157 YGOKAILFLPLPVSSD 172

## RESULT 15

ID P70482 standard; Protein; 155 AA.  
 AC P70482;  
 DT 13-MAY-1991 (first entry)  
 DE Sequence encoded by complete cDNA sequence of human endothelial  
 DE cell growth factor (ECGF).  
 KW Endothelial cell regeneration; blood vessel regeneration.  
 OS Homo sapiens. Location/Qualifiers  
 FH Key 2..15  
 FT protein /label- Beta ECGF  
 FT protein 16..21  
 FT protein /label- Acidic FGF  
 FT protein 22..155  
 FT /label- Alpha ECGF

PN WO8705332-A.  
 PD 11-SEP-1987.  
 PF 02-MAR-1987; U00425.  
 PR 03-MAR-1986; US-835594.  
 PR 26-MAR-1987; ES-000812.  
 PA (MELO-) MELOY LAB INC.  
 PA (RORE-) RORER BIOTECHN INC.  
 PA (RORE-) RORER.  
 PA BIOTECH INC.  
 PI Jaye W, Burgess W, Maciag T, Drohan W;  
 DR WPI; 87-264128/37.  
 DR N-PSDB; N70788  
 PT Human endothelial cell growth factor - produced by recombinant  
 PT DNA techniques; useful for wound healing  
 PS Example; Fig 8; 43pp; English.  
 CC To screen the human brain stem cDNA library for clones contg. ECGF  
 CC inserts, a specific oligonucleotide was designed. This  
 CC oligonucleotide was based upon a partial AA sequence analysis of  
 CC the amino terminus of ECGF (see P70480 and P70481). Fig 3c sets  
 CC forth for comparison the AA sequence of cyanogen bromide-cleaved  
 CC bovine alpha and beta ECGF (P70834). The two clones that were  
 CC isolated, ECGF clones 1 and 29, were analysed in further detail. The  
 CC nucleotide sequence of these clones and the AA sequence deduced from  
 CC the nucleic acid sequence is shown in Fig 8 (see N70788 and P70482).  
 SQ Sequence 155 AA;

Query Match 79.3%; Score 985; DB 1; Length 155;  
 Best Local Similarity 98.5%; Pred. No. 2.79e-87;  
 Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;

Db 20 PGNKKPKLLYCSNGGHFLRILPDGTGTRDRSDQHIQLQLSAESVGEVYIKSTETGQY 79  
 QY 37 SANYKKPKLLYCSNGGHFLRILPDGTGTRDRSDQHIQLQLSAESVGEVYIKSTETGQY 96  
 Db 80 LAMDTGGLLYGSQTPNEECFLERLEENHYNTYISKKAENKWFVGLKNGSKRGPRTH 139  
 QY 97 LAMDTGGLLYGSQTPNEECFLERLEENHYNTYISKKAENKWFVGLKNGSKRGPRTH 156  
 Db 140 YGOKAILFLPLPVSSD 155  
 QY 157 YGOKAILFLPLPVSSD 172

Search completed: Tue Aug 29 16:10:00 2000  
 Job time : 13 secs.



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MPSRELH  
(TM)  
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MPsrch\_pp protein - protein database search, using Smith-Waterman algorithm  
on: Tue Aug 29 16:09:12 2000; MasPar time 10.82 Seconds  
750.147 Million cell updates/sec  
Molecular output not generated.

Title: >US-09-121-017B-25  
Description: (1-172) from US09121017B.pep  
Perfect Score: 1242  
Sequence: 1 MSGRGAGRVQGTQLALVFLGV.....PRTHYGKAILFLPLPVSSD 172

Scoring table: PAM 150  
Gap 11

Searched: 142080 seqs, 47172406 residues

Post-processing: Minimum Match 0%  
Listing first 45 summaries

Database: p1r64  
1:p1r1 2:p1r2 3:p1r3 4:p1r4

Statistics: Mean 43.236; Variance 75.292; scale 0.574

Pred. No. is the number of results predicted by chance to have a  
score greater than or equal to the score of the result being printed,  
and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description	Pred. No.
1	985	79.3	155	1	A33665 acidic fibroblast-gro	3.91e-199
2	968	77.9	155	1	A60721 acidic fibroblast gro	4.47e-195
3	966	77.8	155	2	D37360 acidic fibroblast gro	1.34e-194
4	966	77.8	155	2	S04147 acidic fibroblast gro	1.34e-194
5	954	76.8	152	2	JH0476 acidic fibroblast gro	9.79e-192
6	917	73.8	155	1	GKBOA acidic fibroblast gro	6.43e-183
7	916	73.8	155	2	A60130 acidic fibroblast gro	1.11e-182
8	906	72.9	155	2	JW0055 fibroblast growth fac	2.67e-180
9	531	42.8	189	2	A48834 basic fibroblast grow	2.60e-92
10	529	42.6	146	1	S00185 basic fibroblast grow	7.50e-92
11	525	42.3	157	1	GKBOB basic fibroblast grow	6.23e-91
12	518	41.7	210	2	A32398 basic fibroblast grow	2.52e-89
13	513	41.3	154	2	C37360 basic fibroblast grow	3.53e-88
14	513	41.3	154	2	A31674 basic fibroblast grow	3.53e-88
15	500	40.3	184	2	S31622 basic fibroblast grow	3.35e-85
16	494	39.8	155	1	A40117 basic fibroblast grow	7.88e-84
17	475	38.2	137	2	I46711 fibroblast growth fac	1.70e-79
18	350	28.2	208	2	A48137 fibroblast growth fac	1.79e-51
19	350	28.2	208	2	S66486 fibroblast growth fac	1.79e-51
20	329	26.5	207	2	JC5941 fibroblast growth fac	7.12e-47
21	324	26.1	207	2	JC5940 fibroblast growth fac	8.75e-46
22	302	24.3	194	2	S49501 keratinocyte growth f	5.06e-41
23	299	24.1	194	1	A36301 fibroblast growth fac	2.24e-40

ALIGNMENTS

RESULT	1				
ENTRY	A33665	#type complete			
TITLE	acidic fibroblast growth factor 1 precursor - human				
ALTERNATE_NAMES	beta-ECGF; endothelial cell growth factor beta; heparin-binding growth factor 1				
ORGANISM	#formal_name Homo sapiens #common_name man				
DATE	10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 10-Sep-1999				
ACCESSIONS	A33665; A32316; S18217; A43804; A24662; JH0707; S35535; S35536; I39413; A23553; A24820; A24243; A24301; A26386; A33639				
REFERENCE	A33665				
#authors	Mergia, A.; Tischer, E.; Graves, D.; Tumolo, A.; Miller, J.; Gospodarowicz, D.; Abraham, J.A.; Shipley, G.D.; Fiddes, J.C.				
#journal	Biochem. Biophys. Res. Commun. (1989) 164:1121-1129				
#title	Structural analysis of the gene for human acidic fibroblast growth factor				
#cross-references	MUID:90073637				
#accession	A33665				
#molecule_type	DNA				
#residues	1-155	#label MER			
#cross-references	GB:M30491				
REFERENCE	A32316				
#authors	Wang, W.P.; Lehtoma, K.; Varban, M.L.; Krishnan, I.; Chiu, I.M.				
#journal	Mol. Cell. Biol. (1989) 9:2387-2395				
#title	Cloning of the gene coding for human class 1 heparin-binding growth factor and its expression in fetal tissues.				
#cross-references	MUID:89343957				
#accession	A32316				
#molecule_type	DNA				
#residues	1-155	#label WAN			
#cross-references	GB:M23087; NID:g183875; PIDN:AAA52638.1; PID:g386768				
REFERENCE	S18217				
#authors	Wang, W.P.; Quick, D.; Balcerzak, S.P.; Needleman, S.W.; Chiu, I.M.				
#journal	Oncogene (1991) 6:1521-1529				
#title	Cloning and sequence analysis of the human acidic fibroblast growth factor gene and its preservation in leukemia patients				
#cross-references	MUID:92019819				
#accession	S18217				
#molecule_type	DNA				
#residues	1-155	#label WA2			
#cross-references	EMBL:M23086				
REFERENCE	A43804				

```

#authors      Chiu, I.M.; Wang, W.P.; Lehtoma, K.
#journal      Oncogene (1990) 5:755-762
#title        Alternative splicing generates two forms of mRNA coding for
#             human heparin-binding growth factor 1.
#cross-references MUID:90265618
#accession    A43804
#molecule_type mRNA
#residues     1-155 #label CHI
##cross-references EMBL:X51943; NID:g32435; PIDN:CAA36206.1; PID:g32436
REFERENCE
#journal      A24662
#authors      Jaye, M.; Howk, R.; Burgess, W.; Ricca, G.A.; Chiu, I.M.;
              Ravera, M.W.; O'Brien, S.J.; Modi, W.S.; Maciag, T.;
              Drohan, W.N.
#journal      Science (1986) 233:541-545
#title        Human endothelial cell growth factor: cloning, nucleotide
#             sequence, and chromosome localization.
#cross-references MUID:86261805
#accession    A24662
#molecule_type mRNA
#residues     1-155 #label JAY
##cross-references GB:M13361; NID:g181941; PIDN:AAA79245.1; PID:g181942
REFERENCE
#journal      JH0707
#authors      Yu, Y.L.; Kha, H.; Golden, J.A.; Migchielsen, A.A.J.; Goetzl,
              E.J.; Turck, C.W.
#journal      J. Exp. Med. (1992) 175:1073-1080
#title        An acidic fibroblast growth factor protein generated by
#             alternate splicing acts like an antagonist.
#cross-references MUID:92202857
#accession    JH0707
#molecule_type mRNA
#residues     1-155 #label YUY
##cross-references GB:X65778; NID:g396163; PIDN:CAA46661.1; PID:g396164
REFERENCE
#journal      Payson, R.A.; Canatan, H.; Chotani, M.A.; Wang, W.P.; Harris,
              S.E.; Myers, R.L.; Chiu, I.M.
#journal      Nucleic Acids Res. (1993) 21:489-495
#title        Cloning of two novel forms of human acidic fibroblast growth
#             factor (aFGF) mRNA.
#cross-references MUID:93181239
#accession    S35535
#status       translation not shown
#molecule_type mRNA
#residues     1-58 #label PAY
##cross-references GB:L01485
#accession    S35536
#status       translation not shown
#molecule_type mRNA
#residues     1-58 #label PA2
##cross-references GB:L01487
REFERENCE
#journal      Crumley, G.; Dionne, C.A.; Jaye, M.
#journal      Biochem. Biophys. Res. Commun. (1990) 171:7-13
#title        The gene for human acidic fibroblast growth factor encodes
#             two upstream exons alternatively spliced to the first
#             coding exon.
#cross-references MUID:90365758
#accession    I39413
#status       translation not shown
#molecule_type mRNA
#residues     1-40 #label RES
##cross-references GB:M60515; NID:g178226; PIDN:AAA51672.1; PID:g553170;
              GB:M60516; NID:g178232; PID:g553171
REFERENCE
#journal      Harper, J.W.; Strydom, D.J.; Lobb, R.R.
#journal      Biochemistry (1986) 25:4097-4103
#cross-references MUID:86296647
#accession    A23553
#molecule_type protein
#residues     16-155 #label HAR
REFERENCE
#journal      Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal      Biochem. Biophys. Res. Commun. (1986) 138:611-617
#title        The complete amino acid sequence of human brain-derived
              acidic fibroblast growth factor.
#cross-references MUID:86295741
#accession    A24820
#molecule_type protein
#residues     16-155 #label GIM
REFERENCE
#journal      Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal      Biochem. Biophys. Res. Commun. (1986) 135:541-548
#title        Human brain-derived acidic and basic fibroblast growth
              factors: amino terminal sequences and specific mitogenic
              activities.
#cross-references MUID:86186784
#accession    A24243
#molecule_type protein
#residues     16-47 #label GI2
##experimental_source brain
REFERENCE
#journal      Gautschi-Sova, P.; Muller, T.; Bohlen, P.
#journal      FEBS Lett. (1986) 204:203-207
#title        Partial molecular characterization of endothelial cell
              mitogens from human brain: acidic and basic fibroblast
              growth factors.
#cross-references MUID:86275260
#accession    A24301
#molecule_type protein
#residues     16-30, 'X', 32-49 #label GAU
REFERENCE
#journal      Gautschi-Sova, P.; Muller, T.; Bohlen, P.
#journal      Biochem. Biophys. Res. Commun. (1986) 140:874-880
#title        Amino acid sequence of human acidic fibroblast growth factor.
#cross-references MUID:87048871
#accession    A26386
#molecule_type protein
#residues     16-155 #label GA2
##experimental_source brain
REFERENCE
#journal      Chavan, A.J.; Haley, B.E.; Volkin, D.B.; Marfia, K.E.;
              Verticelli, A.M.; Bruner, M.W.; Draper, J.P.; Burke, C.J.;
              Middaugh, C.R.
#journal      Biochemistry (1994) 33:7193-7202
#title        Interaction of nucleotides with acidic fibroblast growth
              factor (FGF-1).
#cross-references MUID:94271773
#accession    A53639
#molecule_type protein
#residues     16-30, 'X', 32-38; 73-75, 'X', 77-97, 'X', 99-101; 128-131, 'X',
              133-140, 'X', 142-152 #label CHA
GENETICS
#gene         GDB:FGF1; FGFA
##cross-references GDB:119909; OMIM:131220
#map_position 5q31.3-5q33.2
#introns      57/1; 91/3
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS       alternative splicing; growth factor; heparin binding
FEATURE
16-155        #product fibroblast growth factor 1 #status experimental
              #label HAR\
129           #binding_site carbohydrate (Asn) (covalent) #status
              absent
SUMMARY        #length 155 #molecular-weight 17460 #checksum 9243
Query Match   79.38; Score 985; DB 1; Length 155;
Best Local Similarity 98.5%; Pred. No. 3.91e-199;
Matches 134; Conservative 2; Mismatches 0; Indels 0; Gaps 0;
Db 20 PGNYKPKLLYCSNGGHFLRILPDGTVDRSDHQHQLQLSAESVGEYIKSTEGQY 79
:::|||||
Qy 37 SANYKPKLLYCSNGGHFLRILPDGTVDRSDHQHQLQLSAESVGEYIKSTEGQY 96
:::|||||
Db 80 LAMDTGLLYGSGTPTNEECFLERLEENHYNTYISKHAENKMFVGLKKNKSGCKRGPRTH 139
|||||
Qy 97 LAMDTGLLYGSGTPTNEECFLERLEENHYNTYISKHAENKMFVGLKKNKSGCKRGPRTH 156
|||||

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Db 140 YGOKAILFLPLPVSSD 155
      |||
Qy 157 YGOKAILFLPLPVSSD 172

RESULT 2
ENTRY   A60721 #type complete
TITLE   acidic fibroblast growth factor - golden hamster
ALTERNATE_NAMES #heparin-binding growth factor 1
ORGANISM #formal_name Mesocricetus auratus #common_name golden hamster
DATE     10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change
10-Sep-1999
ACCESSIONS A60721
REFERENCE #authors H.; Harris, S.E.
#journal J. Cell. Biochem. (1990) 43:17-26
#title Characterization of the hamster DDT-1 cell aFGF/HBGF-I gene
        and cDNA and its modulation by steroids.
#cross-references MUID:90270291
#accession A60721
#status not compared with conceptual translation
#molecule_type DNA
#residues 1-155 #label HAL
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17403 #checksum 9573

Query Match 77.9%; Score 968; DB 1; Length 155;
Best Local Similarity 96.3%; Pred. No. 4.47e-195;
Matches 131; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 20 PGNYKKPKLLYCSNGGHFRLIPDGTVDGTRDRSDQHIOQLSAESAGEVYIKGTETGOYL 79
      :|||
Qy 37 SANIKPKLLYCSNGGHFRLIPDGTVDGTRDRSDQHIOQLSAESAGEVYIKGTETGOYL 96
      :|||

Db 80 LAMDTGLLYGSQTPNEECLFLERLEENHYNTYTSKKHAEKNWFVGLKKNKSGCKRGPRTH 139
      :|||
Qy 97 LAMDTGLLYGSQTPNEECLFLERLEENHYNTYISKKHAEKNWFVGLKKNKSGCKRGPRTH 156
      :|||

Db 140 YGOKAILFLPLPVSSD 155
      |||
Qy 157 YGOKAILFLPLPVSSD 172

RESULT 3
ENTRY   D37360 #type complete
TITLE   acidic fibroblast growth factor - mouse
ALTERNATE_NAMES aFGF; FGF-1
ORGANISM #formal_name Mus musculus #common_name house mouse
DATE     17-Apr-1993 #sequence_revision 17-Apr-1993 #text_change
16-Jul-1999
ACCESSIONS D37360; JC5231
REFERENCE #authors Hebert, J.M.; Basilico, C.; Goldfarb, M.; Haub, O.; Martin,
        G.R.
#journal Dev. Biol. (1990) 138:454-463
#title Isolation of cDNAs encoding four mouse FGF family members and
        characterization of their expression patterns during
        embryogenesis.
#cross-references MUID:90201563
#accession D37360
#status preliminary
#molecule_type mRNA
#residues 1-155 #label HEB
#cross-references GB:N30641; NID:g193284; PIDN:AAA37618.1; PID:g309236
JC5231
#authors Madial, F.; Hackshaw, K.V.; Chiu, I.M.
#journal Gene (1996) 179:231-236
#title Cloning and Characterization of the mouse Fgf-1 gene.
#cross-references MUID:97128312
#accession JC5231
#status preliminary

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#molecule_type DNA
#residues 1-155 #label MAD
#cross-references GB:U36456
COMMENT This protein is an inducer of neovascularization in angiogenic
        disease including atherosclerosis, cancer and inflammatory
        autoimmune disease.

GENETICS
#gene Fgf-1
#introns 57/1; 91/3
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341

Query Match 77.8%; Score 966; DB 2; Length 155;
Best Local Similarity 96.3%; Pred. No. 1.34e-194;
Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFRLIPDGTVDGTRDRSDQHIOQLSAESAGEVYIKGTETGOYL 80
      :|||
Qy 38 ANYKKPKLLYCSNGGHFRLIPDGTVDGTRDRSDQHIOQLSAESAGEVYIKGTETGOYL 97
      :|||

Db 81 AMDTEGLLYGSQTPNEECLFLERLEENHYNTYTSKKHAEKNWFVGLKKNKSGCKRGPRTH 140
      :|||
Qy 98 AMDTDGLLYGSQTPNEECLFLERLEENHYNTYISKKHAEKNWFVGLKKNKSGCKRGPRTH 157
      :|||

Db 141 GOKAILFLPLPVSSD 155
      |||
Qy 158 GOKAILFLPLPVSSD 172

RESULT 4
ENTRY   S04147 #type complete
TITLE   acidic fibroblast growth factor 1 - rat
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Rattus norvegicus #common_name Norway rat
DATE     28-Feb-1990 #sequence_revision 28-Feb-1990 #text_change
16-Jul-1999
ACCESSIONS S04147
REFERENCE #authors Goodrich, S.P.; Yan, G.C.; Bahrenburg, K.; Mansson, P.E.
#journal Nucleic Acids Res. (1989) 17:2867
#title The nucleotide sequence of rat heparin binding growth factor
        1 (HBGF-1).
#cross-references MUID:89240051
#accession S04147

#molecule_type mRNA
#residues 1-155 #label GOO
#cross-references EMBL:X14232; NID:g56351; PIDN:CAA32448.1; PID:g56352
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341

Query Match 77.8%; Score 966; DB 2; Length 155;
Best Local Similarity 96.3%; Pred. No. 1.34e-194;
Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFRLIPDGTVDGTRDRSDQHIOQLSAESAGEVYIKGTETGOYL 80
      :|||
Qy 38 ANYKKPKLLYCSNGGHFRLIPDGTVDGTRDRSDQHIOQLSAESAGEVYIKGTETGOYL 97
      :|||

Db 81 AMDTEGLLYGSQTPNEECLFLERLEENHYNTYTSKKHAEKNWFVGLKKNKSGCKRGPRTH 140
      :|||
Qy 98 AMDTDGLLYGSQTPNEECLFLERLEENHYNTYISKKHAEKNWFVGLKKNKSGCKRGPRTH 157
      :|||

Db 141 GOKAILFLPLPVSSD 155
      |||
Qy 158 GOKAILFLPLPVSSD 172

RESULT 5
ENTRY   JH0476 #type fragment
TITLE   acidic fibroblast growth factor - pig (fragment)
ORGANISM #formal_name Sus scrofa domestica #common_name domestic pig
DATE     31-Mar-1992 #sequence_revision 31-Mar-1992 #text_change

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16-Jul-1999
ACCESSIONS JH0476; S20072
REFERENCE JH0476
#authors Schmidt, M.; Sharma, H.S.; Schott, R.J.; Schaper, W.
#journal Biochem. Biophys. Res. Commun. (1991) 180:853-859
#title Amplification and sequencing of mRNA encoding acidic
#cross-references MUID:92062117 fibroblast growth factor (aFGF) from porcine heart.
#accession JH0476
#molecule_type mRNA
#residues 1-152 #label SCH
#cross-references EMBL:X60317; NID:g1873; PIDN:CAA42869.1; PID:g1874
#experimental_source heart
#note the hydrophobic core residues are packed around the
internal symmetry axis
COMMENT This protein belongs to the fibroblast growth factor family.
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
FEATURE
22-28 #region nuclear location signal\
133 #binding_site heparin (lys) #status predicted
SUMMARY
length 152 #checksum 1124
Query Match 76.8%; Score 954; DB 2; Length 152;
Best Local Similarity 96.2%; Pred. No. 9,79e-192;
Matches 128; Conservative 3; Mismatches 2; Indels 0; Gaps 0;
Db 20 PGNKKPKLYCSNGHFLRLPDGTGTRDRSDHQIQLQSAESVGEVYIKSTETGQY 79
:|||||
Qy 37 SANYKKPKLYCSNGHFLRLPDGTGTRDRSDHQIQLQSAESVGEVYIKSTETGQY 96
|||||
Db 80 LAMDTGLLYGSQTPSECLFLERLEENHYNTYTSKHAENWFVGLKNGSKRGPRTH 139
|||||
Qy 97 LAMDTGLLYGSQTPSECLFLERLEENHYNTYTSKHAENWFVGLKNGSKRGPRTH 156
|||||
Db 140 YGQKAILFLPLPV 152
Qy 157 YGQKAILFLPLPV 169
|||||
RESULT 6
ENTRY GKBOA #type complete
TITLE acidic fibroblast growth factor precursor - bovine
ALTERNATE_NAMES aFGF; eye-derived growth factor II; heparin-binding growth
factor I; prostatriptin
ORGANISM #formal_name Bos primigenius taurus #common_name cattle
DATE 13-Aug-1986 #sequence_revision 03-Feb-1994 #text_change
18-Jun-1999
ESSIONS JH0613; S02102; S02065; B24663; A94281; S03953;
A91010; A24477; B25043; C25043; A25043; A24539; A60884;
A37892; B37892; A61198; I46024; A34477; A01385
REFERENCE JH0613
#authors Renaud, F.; Desset, S.; Bugra, K.; Halley, C.; Philippe,
J.M.; Courtois, Y.; Laurent, M.
#journal Biochem. Biophys. Res. Commun. (1992) 184:945-952
#title Heterogeneity of 3' untranslated region of bovine acidic FGF
transcripts.
#cross-references MUID:92246990
#accession JH0613
#molecule_type DNA
#residues 58-155 #label REN
REFERENCE S02102
#authors Halley, C.; Courtois, Y.; Laurent, M.
#journal Nucleic Acids Res. (1988) 16:10913
#title Nucleotide sequence of bovine acidic fibroblast growth factor
cDNA.
#cross-references MUID:89083506
#accession S02102
#molecule_type mRNA
#residues 1-155 #label HAL
#cross-references EMBL:X13221; NID:g347; PIDN:CAA31610.1; PID:g348
REFERENCE S02661
#authors Alterio, J.; Halley, C.; Brou, C.; Soussi, T.; Courtois, Y.;

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Laurent, M.
#journal FEBS Lett. (1988) 242:41-46
#title Characterization of a bovine acidic FGF cDNA clone and its
expression in brain and retina.
#cross-references MUID:89078619
#accession S02661
#molecule_type mRNA
#residues 1-155 #label ALT
#cross-references EMBL:X14032; NID:g322; PIDN:CAA32192.1; PID:g323
REFERENCE S22065
#authors Philippe, J.M.
#submmission submitted to the EMBL Data Library, May 1992
#accession S22065
#molecule_type mRNA
#residues 1-18 #label PHI
#cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
REFERENCE A94290
#authors Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman,
J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal Science (1986) 233:545-548
#title Nucleotide sequence of a bovine clone encoding the angiogenic
protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession B24663
#molecule_type mRNA
#residues 62-102 #label ABR
REFERENCE A94281
#authors Gimenez-Gallego, G.; Rodkey, J.; Bennett, C.; Rios-Candelore,
M.; DiSalvo, J.; Thomas, K.
#journal Science (1985) 230:1385-1388
#title Brain-derived acidic fibroblast growth factor: complete amino
acid sequence and homologies.
#cross-references MUID:86070224
#accession A94281
#molecule_type protein
#residues 16-155 #label GIM
REFERENCE S03953
#authors Quinkler, W.; Maasberg, M.; Bernotat-Danielowski, S.; Luethe,
N.; Sharma, H.S.; Schaper, W.
#journal Eur. J. Biochem. (1989) 181:67-73
#title Isolation of heparin-binding growth factors from bovine,
porcine and canine hearts.
#cross-references MUID:89231704
#accession S03953
#molecule_type protein
#residues 16-45 #label QUI
REFERENCE A91010
#authors Bohlen, P.; Esch, F.; Baird, A.; Gospodarowicz, D.
#journal EMBO J. (1985) 4:1951-1956
#title Acidic fibroblast growth factor (FGF) from bovine brain:
amino-terminal sequence and comparison with basic FGF.
#cross-references MUID:86055750
#accession A91010
#molecule_type protein
#residues 16-30, 'X', 32-34, 'X', 36-44 #label BOH
REFERENCE A24477
#authors Crabb, J.W.; Armes, L.G.; Carr, S.A.; Johnson, C.M.; Roberts,
G.D.; Bordoli, R.S.; McKeenan, W.L.
#journal Biochemistry (1986) 25:4988-4993
#title Complete primary structure of prostatriptin, a prostate
epithelial cell growth factor.
#cross-references MUID:87026586
#accession A24477
#molecule_type protein
#residues 2, 'GE', 5-155 #label CRA
REFERENCE A94127
#authors Burgess, W.H.; Mehlman, T.; Marshak, D.R.; Fraser, B.A.;
Maciag, T.
#journal Proc. Natl. Acad. Sci. U.S.A. (1986) 83:7216-7220
#title Structural evidence that endothelial cell growth factor beta
is the precursor of both endothelial cell growth factor
alpha and acidic fibroblast growth factor.
#cross-references MUID:87016918

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#accession B25043
##molecule_type protein
##residues 2-155 #label BUR
##note this form was designated beta endothelial cell growth factor

#accession C25043
##molecule_type protein
##residues 16-155 #label BU2
##note this form was designated acidic fibroblast growth factor

#accession A25043
##molecule_type protein
##residues 22-155 #label BU3
##note this form was designated alpha endothelial cell growth factor

REFERENCE A24539
#authors Strydom, D.J.; Harper, J.W.; Lobb, R.R.
#journal Biochemistry (1986) 25:945-951
#title Amino acid sequence of bovine brain derived class 1 heparin-binding growth factor.

#cross-references MUID:86187766
#accession A24539
##molecule_type protein
##residues 16-155 #label STR

REFERENCE A60884
#authors Thomas, K.A.; Gimenez-Gallego, G.; Rios-Candelore, M.; DiSalvo, J.
#journal J. Protein Chem. (1987) 6:163-171
#title Primary structure and mitogenic and angiogenic activities of brain-derived acidic fibroblast growth factor.

#accession A60884
##molecule_type protein
##residues 16-155 #label THO

REFERENCE A37892
#authors Kuo, M.D.; Huang, S.S.; Huang, J.S.
#journal J. Biol. Chem. (1990) 265:16455-16463
#title Acidic fibroblast growth factor receptor purified from bovine liver is a novel protein tyrosine kinase.

#cross-references MUID:90375514
#accession A37892
##molecule_type protein
##residues 22-30,'X',32-38 #label KU2
##note this form was designated brain-derived growth factor A

#accession B37892
##molecule_type protein
##residues 62-76,'X',78-86 #label KUO
##note this sequence is an amino-terminal fragment of a form designated as brain-derived growth factor B

REFERENCE A61198
#authors Hill, C.E.; Belford, D.A.; Godovac-Zimmermann, J.; Hendry, I.A.
#journal Brain Res. Dev. Brain Res. (1991) 63:13-19
#title Class 1 heparin binding growth factor promotes the differentiation but not the survival of ciliary neurones in vivo.

#cross-references MUID:92164087
#accession A61198
##molecule_type protein
##residues 11-26;28-50;53-110,'H',112,'NTY';134-155 #label HIL

REFERENCE I46024
#authors Philippe, J.M.; Renaud, F.; Desset, S.; Laurent, M.; Mallet, J.; Courtois, Y.; Edwards, J.B.
#journal Biochem. Biophys. Res. Commun. (1992) 188:843-850
#title Cloning of two different 5' untranslated exons of bovine acidic fibroblast growth factor by the single strand ligation to single-stranded cDNA methodology.

#cross-references MUID:93075172
#accession I46024
##status translated from GB/EMBL/DBJ
##molecule_type mRNA
##residues 1-18 #label PH2
##cross-references EMBL:X66446; NID:9411; PIDN:CAA47063.1; PID:g412 A34477

REFERENCE A34477
#authors Sasaki, H.; Hoshi, H.; Hong, Y.M.; Suzuki, T.; Kato, T.;

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Sasaki, H.; Saito, M.; Youki, H.; Karube, K.; Konno, S.; Onodera, M.; Saito, T.; Aoyagi, S.
J. Biol. Chem. (1989) 264:17608-17612
Purification of acidic fibroblast growth factor from bovine heart and its localization in the cardiac myocytes.

#cross-references MUID:90008933
#accession A34477
##status preliminary
##molecule_type protein
##residues 16-24;121-127;134-143 #label SAS
##experimental_source heart

COMMENT The acidic and basic fibroblast growth factors are the major endothelial-cell growth factors. Both are angiogenic agents in vivo and are potent mitogens for a variety of mesoderm-derived cell types in vitro (although bFGF is 30-100 times more potent than aFGF in stimulating the proliferation of normal diploid cells). There are differences in the tissue distribution and concentration of these two growth factors.

COMMENT This protein binds heparin, although less strongly than does bFGF. There are some sequence similarities between residues 117-126 (a region flanked by Lys-Lys dipeptides) and a number of neuropeptides, including a gastrin-releasing peptide from the pig

...
Note: remainder of annotations omitted.

Query Match 73.8%; Score 917; DB 1; Length 155;
Best Local Similarity 91.9%; Pred. No. 6.43e-183;
Matches 124; Conservative 6; Mismatches 5; Indels 0; Gaps 0;

Db 21 GNYKPKLLYCSNGGYFLRLPDPDGTGDKRSDQHIQLQCAESIGEVYIKSTGTGQFL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 38 GNYKPKLLYCSNGGHFLRLPDPDGTGDKRSDQHIQLQSAESVGEVYIKSTGTGQYL 97

Db 81 AMDTGLLYGSOTPNNECLFLERLEENHYNYISKKHAEKHFVGLKNGRSKLGPRTHF 140
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 98 AMDTGLLYGSOTPNNECLFLERLEENHYNYISKKHAEKHFVGLKNGRSKLGPRTHY 157

Db 141 GOKAILFLPLPVSSD 155
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 158 GOKAILFLPLPVSSD 172

RESULT 7
ENTRY A60130 #type complete
TITLE acidic fibroblast growth factor - chicken
ALTERNATE_NAMES endothelial cell growth factor
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE 03-Mar-1993 #sequence_revision 03-Mar-1993 #text_change 16-Jul-1999
ACCESSIONS A60130; S02639
REFERENCE A60130
#authors Schnuerch, H.; Risau, W.
#journal Development (1991) 111:1143-1154
#title Differentiating and mature neurons express the acidic fibroblast growth factor gene during chick neural development
#cross-references MUID:91347925
#accession A60130
##status preliminary
##molecule_type mRNA
##residues 1-155 #label SCH
##cross-references GB:S63263; NID:9234372; PIDN:NAB16629.1; PID:g234373 S02639
REFERENCE S02639
#authors Risau, W.; Gautschi-Sova, P.; Boehlen, P.
#journal EMBO J. (1988) 7:959-962
#title Endothelial cell growth factors in embryonic and adult chick brain are related to human acidic fibroblast growth factor.

#cross-references MUID:88296438
#accession S02639
##molecule_type protein
##residues 22-30,'X',32-44,'X',46-48 #label RTJ
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor

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SUMMARY      #length 155 #molecular-weight 17322 #checksum 7617

Query Match      73.8%; Score 916; DB 2; Length 155;
Best Local Similarity 90.4%; Pred. No. 1.11e-182;
Matches 122; Conservative 6; Mismatches 7; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHLRLPLDGTGDRSDQHIQLQLSAEDVGEVIYIKSTAGQYL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
38 ANYKKPKLLYCSNGGHLRLPLDGTGDRSDQHIQLQLSAESVGEVIYIKSTAGQYL 97
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Db 81 AMDTNGLLYGSQSPNECLFLERLEENHYNTYISKHAKNWFVGLKKNKSLGRPTHY 140
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QY 98 AMDTGLLYGSQTPNECLFLERLEENHYNTYISKHAKNWFVGLKKNKSGCKRGPRTHY 157
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Db 141 GOKAILFLPLPVSSD 155
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 158 GOKAILFLPLPVSSD 172
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

SULT 8
TRY
TITLE      JW0055 #type complete
ALTERNATE_NAMES      FGF-1 fibroblast growth factor-1 - sheep
ORGANISM      #formal_name Ovis sp. #common_name sheep
DATE      17-Jun-1998 #sequence_revision 10-Jul-1998 #text_change
07-May-1999
ACCESSIONS      JW0055
REFERENCE      JW0055
#authors      Grieb, T.W.; Ring, M.; Brown, E.; Palmer, C.; Belle, N.;
Donjerkoivic, D.; Chang, H.; Yun, J.; Subramanian, R.;
Forozan, F.; Guo, Y.; Vertes, A.; Winkles, J.A.; Burgess,
W.H.
#journal      Biochem. Biophys. Res. Commun. (1998) 246:182-191
#title      Primary structure of ovine fibroblast growth factor-1 deduced
by protein and cDNA analysis.
#cross-references MUID:98262939
#accession      JW0055
#molecule_type      mRNA
#residues      1-155 #label GRI
COMMENT      This protein is a potent mitogenic factor for NIH 3T3 fibroblasts
in the absence of heparin.
CLASSIFICATION      #superfamily fibroblast growth factor
SUMMARY      #length 155 #molecular-weight 17557 #checksum 8890

Query Match      72.9%; Score 906; DB 2; Length 155;
Best Local Similarity 90.4%; Pred. No. 2.67e-180;
Matches 122; Conservative 8; Mismatches 5; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHLRLPLDGTGDRSDQHIQLQLSAESVGEVIYIKSTAGQYL 80
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38 ANYKKPKLLYCSNGGHLRLPLDGTGDRSDQHIQLQLSAESVGEVIYIKSTAGQYL 97
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Db 81 AMDTNGLLYGSQSPNECLFLERLEENHYNTYISKHAKNWFVGLKKNKSLGRPTHY 140
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 98 AMDTGLLYGSQTPNECLFLERLEENHYNTYISKHAKNWFVGLKKNKSGCKRGPRTHY 157
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Db 141 GOKAILFLPLPVSSD 155
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 158 GOKAILFLPLPVSSD 172
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 9
ENTRY      A48834 #type complete
TITLE      basic fibroblast growth factor - chicken
ORGANISM      #formal_name Gallus gallus #common_name chicken
DATE      01-Dec-1993 #sequence_revision 18-Nov-1994 #text_change
16-Jul-1999
ACCESSIONS      A48834; S23636
REFERENCE      A48834
#authors      Borja, A.Z.; Meijers, C.; Zeller, R.
Dev. Biol. (1993) 157:110-118
#journal      Expression of alternatively spliced bFGF first coding exons
and antisense mRNAs during chicken embryogenesis.
#title

```

This protein binds heparin more strongly than does aFGF.

```

CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS alternative splicing; angiogenesis; growth factor; heparin
binding; mitogen

FEATURE
1-157 #product basic fibroblast growth factor, uterine form
#status predicted #label MAT1\
4-157 #product basic fibroblast growth factor, pituitary gamma
form #status experimental #label MAT2\
12-157 #product basic fibroblast growth factor, pituitary alpha
form #status experimental #label MAT3\
16-157 #product basic fibroblast growth factor, pituitary short
form #status predicted #label MAT4\
23-157 #product basic fibroblast growth factor, hepatic form
#status experimental #label MAT5\
27-157 #product basic fibroblast growth factor, renal form
#status experimental #label MAT6\
29-33,118-121 #region heparin binding #status predicted\
4 #modified_site blocked amino end (Ala) (in mature form
pituitary gamma) (probably acetylated) #status
experimental
#length 157 #checksum 1115

QUERY
Query Match 42.3%; Score 525; DB 1; Length 157;
Best Local Similarity 52.7%; Pred. No. 6.23e-91;
Matches 77; Conservative 26; Mismatches 41; Indels 2; Gaps 1;

Db 14 LPEDGGGAPPPGKPKLYCKNGGFFLRHPDGRVDGVRKSDPHIKLOQAEERG 73
QY 26 VPSFAGARANGSANYKPKLYCSNGGHFLKLPDGVTRDQHQIQLSAESVGE 85
Db 74 VSIKGVCANRYLAKMDGRLASCVTDECFERLESNNYTYRSKYS--SWYALKR 131
QY 86 VYIKSTGTQYLANDTGLLYGSGTQPNEECLFLERLENNHYNTYISKHAENWFVLKK 145
Db 132 TGQKLGPKTGPQKAILFLPMSAKS 157
QY 146 NSCKRGPRTHYGOKAILFLPLVSS 171

RESULT 12
ENTRY #type complete
TITLE basic fibroblast growth factor precursor, 22.5K form - human
ALTERNATE_NAMES bFGF; fibroblast growth factor 2; prostatic growth factor;
prostatropin
CONTAINS basic fibroblast growth factor, 18K form
ORGANISM #formal_name Homo sapiens #common_name man
DATE 31-Jul-1989 #sequence_revision 31-Dec-1993 #text_change
16-Jul-1999
#cross-references A61537; A26642; B32878; S00297; A54316; B54316;
A33624; A25824; B24243; B24301; S42242; B55784; I52267;
S46253
#molecule_type mRNA
REFERENCE A32398
#authors Prats, H.; Kaghad, M.; Prats, A.C.; Klagsbrun, M.; Lelias,
J.M.; Liauzun, P.; Chalon, P.; Tauber, J.P.; Amalric, F.;
Smith, J.A.; Caput, D.
#journal Proc. Natl. Acad. Sci. U.S.A. (1989) 86:1836-1840
#title High molecular mass forms of basic fibroblast growth factor
are initiated by alternative CUG codons.
#cross-references MUID:89184522
#accession A32398
#molecule_type mRNA
#residues 1-210 #label PRA
#cross-references GB:J04513; NID:g183083; PIDN:AAA52531.1; PID:g459811
A61537
#authors Shibata, F.; Baird, A.; Florkiewicz, R.Z.
#journal Growth Factors (1991) 4:277-287
#title Functional characterization of the human basic fibroblast
growth factor gene promoter.
#cross-references MUID:92110035
#accession A61537
#molecule_type DNA
#residues 1-114 #label SHI
#note authors translated the codon GGA for residue 47 as Ala

```

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REFERENCE A26642
#authors Kurokawa, T.; Sasada, R.; Iwane, M.; Igarashi, K.
#journal FEBS Lett. (1987) 213:189-194
#title Cloning and expression of cDNA encoding human basic
fibroblast growth factor.
#cross-references MUID:87162468
#accession A26642
#molecule_type mRNA
#residues 56-210 #label KUR
#cross-references GB:M27968; NID:g182562; PIDN:AAA52448.1; PID:g182563
A30924
#authors Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes,
J.C.
#journal Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668
#title Human basic fibroblast growth factor: nucleotide sequence,
genomic organization, and expression in mammalian cells.
#cross-references MUID:87217066
#accession B32878
#molecule_type mRNA
#residues 56-210 #label ABR
#note the authors translated the codon GAA for residue 108 as
Gly
REFERENCE S00297
#authors Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Friedman,
J.; Gospodarowicz, D.; Fiddes, J.C.
#journal EMBO J. (1986) 5:2523-2528
#title Human basic fibroblast growth factor: nucleotide sequence and
genomic organization.
#cross-references MUID:87053817
#accession S00297
#status not compared with conceptual translation
#molecule_type DNA
#residues 1-155 #label AB2
#note the authors translated the codon GAA for residue 108 as
Gly
REFERENCE A54316
#authors Shimoyama, Y.; Gotoh, M.; Ino, Y.; Sakamoto, M.; Kato, K.;
Hirohashi, S.
#journal Jpn. J. Cancer Res. (1991) 82:1263-1270
#title Characterization of high-molecular-mass forms of basic
fibroblast growth factor produced by hepatocellular
carcinoma cells: possible involvement of basic fibroblast
growth factor in hepatocarcinogenesis.
#cross-references MUID:92091228
#accession A54316
#molecule_type protein
#residues 'XX',86-88,'X',90-91,'X',93-95 #label SH3
#note experimental_source C-Li21 hepatocellular carcinoma cell line
sequence extracted from NCBI backbone (NCBIP:71595)
#accession B54316
#molecule_type protein
#residues 'XXX',19,'X',21-29 #label SH2
#note sequence extracted from NCBI backbone (NCBIP:71594)
REFERENCE A33624
#authors Felge, J.J.; Bradley, J.D.; Fryburg, K.; Farris, J.; Cousins,
L.C.; Barr, P.J.; Baird, A.
#journal J. Cell Biol. (1989) 109:3105-3114
#title Differential effects of heparin, fibronectin, and laminin on
the phosphorylation of basic fibroblast growth factor by
protein kinase C and the catalytic subunit of protein
kinase A.
#cross-references MUID:90078343
#accession A33624
#status preliminary
#molecule_type protein
#residues 57-210 #label FEI
A25824
#authors Story, M.T.; Esch, F.; Shimasaki, S.; Sasse, J.; Jacobs,
S.C.; Lawson, R.K.
#journal Biochem. Biophys. Res. Commun. (1987) 142:702-709
#title Amino-terminal sequence of a large form of basic fibroblast
growth factor isolated from human benign prostatic
hyperplastic tissue.

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#cross-references MUID:87156686
#accession A25824
#molecule_type protein
#residues 57-77 #label STO
#experimental_source prostate
REFERENCE
A90122
#authors
Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal
Biochem. Biophys. Res. Commun. (1986) 135:541-548
#title
Human brain-derived acidic and basic fibroblast growth
factors: amino terminal sequences and specific mitogenic
activities.
#cross-references MUID:86186784
#accession B2423
#molecule_type protein
#residues 65-102,'X',104-105 #label GIM
#experimental_source brain
REFERENCE
A91364
#authors
Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
#journal
FEBS Lett. (1986) 204:203-207
#title
Partial molecular characterization of endothelial cell
mitogens from human brain: acidic and basic fibroblast
growth factors.
#cross-references MUID:86275280
#accession B24301
#molecule_type protein
#residues 65-88,'X',90-98,'X',100 #label GAU
#authors
Sommer, A.; Brewer, M.T.; Thompson, R.C.; Moscatelli, D.;
Presta, M.; Rifkin, D.B.
#journal
Biochem. Biophys. Res. Commun. (1987) 144:543-550
#title
A form of human basic fibroblast growth factor with an
extended amino terminus.
#cross-references MUID:87213238
#accession S42242
#status preliminary
#molecule_type mRNA
#residues 54-210 #label SOM
#cross-references EMBL:M17599; NID:g183086; PID:AAA52534.1;
PID:g183087
REFERENCE
A55784
#authors
Pantoliano, M.W.; Horlick, R.A.; Springer, B.A.; Van Dyk,
D.E.; Tobery, T.; Wetmore, D.R.; Lear, J.D.; Nahapetian,
A.T.; Bradley, J.D.; Sisk, W.P.
#journal
Biochemistry (1994) 33:10229-10248
#title
Multivalent ligand-receptor binding interactions in the
fibroblast growth factor system produce a cooperative
growth factor and heparin mechanism for receptor
dimerization.
#cross-references MUID:94347757
#accession B55784
#molecule_type protein
#residues 54-71 #label PAN
REFERENCE
I52267
#authors
Watson, R.; Anthony, F.; Pickett, M.; Lambden, P.; Masson,
G.M.; Thomas, E.J.
#journal
Biochem. Biophys. Res. Commun. (1992) 187:1227-1231
#title
Reverse transcription with nested polymerase chain reaction
shows expression of basic fibroblast growth factor
transcripts in human granulosa and cumulus cells from in
vitro fertilisation patients.
#cross-references MUID:93038590
#accession I52267
#status preliminary; translated from GB/EMBL/DBJ
#molecule_type mRNA
#residues 95-182 #label RES
#cross-references GB:S47380; NID:g256535
#experimental_source granulosa cells
REFERENCE
S46253
#authors
Petry, V.; Bugler, E.; Amalric, F.; Prome, J.C.; Prats, H.
#journal
FEBS Lett. (1994) 349:23-28
#title
Purification and characterization of the 210-amino acid
recombinant basic fibroblast growth factor form (FGF-2).
#cross-references MUID:94320639
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#accession S46253
#molecule_type protein
#residues 39-53;65-88 #label PAT
#note recombinant gene expressed in Escherichia coli
GENETICS
#gene GDB:FGF2; FGFb
#cross-references GDB:119910; OMIM:134920
#map_position 4q25-4q27
#start_codon CTG
CLASSIFICATION
#superfamily fibroblast growth factor
KEYWORDS
alternative initiators; angiogenesis; growth factor; heparin
binding; mitogen
FEATURE
1-210 #product basic fibroblast growth factor, 22.5K form
65-210 #status predicted #label MA2\
#product basic fibroblast growth factor, 18K form
82-86 #status predicted #label MA\
171-174 #region heparin binding #status predicted\
SUMMARY
#length 210 #molecular-weight 22623 #checksum 3610
Query Match 41.7%; Score 518; DB 2; Length 210;
Best Local Similarity 52.1%; Pred. No. 2.52e-89;
Matches 76; Conservative 27; Mismatches 41; Indels 2; Gaps 1;
Db 67 LPEDGGAGFPFGHFKPKRLKNGGFFLRHPDGRVDGVRKSDPHIKLQLOAEEGV 126
QY 26 VPSAGARANGSANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLSAESVGE 85
Db 127 VSIKGVANRYLAKMEDGRLLASKCVTECEFFERLESNNYNTYRSRYT--SWYVALKR 184
QY 86 VYIKSTETGQVLAMTDGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFGVLKK 145
Db 185 TGOYKLGSKTGPQKAILFLPMSAKS 210
QY 146 NGSKCRGPRTHYGQKAILFLPVS 171
RESULT 13
ENTRY C37360 #type complete
TITLE basic fibroblast growth factor - mouse
ORGANISM #formal_name Mus musculus #common_name house mouse
DATE 17-Apr-1993 #sequence_revision 17-Apr-1993 #text_change
16-Jul-1999
ACCESSIONS C37360
REFERENCE A37360
#authors Hebert, J.M.; Basilico, C.; Goldfarb, M.; Haub, O.; Martin,
G.R.
#journal Dev. Biol. (1990) 138:454-463
#title Isolation of cDNAs encoding four mouse FGF family members and
characterization of their expression patterns during
embryogenesis.
#cross-references MUID:90201563
#accession C37360
#status preliminary
#molecule_type mRNA
#residues 1-154 #label HEB
#cross-references GB:M30644; NID:g193296; PID:AAA37621.1; PID:g309239
CLASSIFICATION
#superfamily fibroblast growth factor
SUMMARY
#length 154 #molecular-weight 17153 #checksum 2906
Query Match 41.3%; Score 513; DB 2; Length 154;
Best Local Similarity 52.7%; Pred. No. 3.53e-88;
Matches 77; Conservative 26; Mismatches 40; Indels 3; Gaps 2;
Db 12 LPEDGGA-AFPFGHFKPKRLKNGGFFLRHPDGRVDGVRKSDPHIKLQLOAEEGV 70
QY 26 VPSAGARANGSANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLSAESVGE 85
Db 71 VSIKGVANRYLAKMEDGRLLASKCVTECEFFERLESNNYNTYRSRYT--SWYVALKR 128
QY 86 VYIKSTETGQVLAMTDGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFGVLKK 145
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Db	129	TGQYKLGSKTGPQKAILFLPMSAKS	154
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QY	146	NGSKRGPRTHYGOKAILFLPLPVSS	171
RESULT	14		
ENTRY	A31674	#type complete	
TITLE	basic fibroblast growth factor precursor - rat		
ALTERNATE_NAMES	bfgf		
ORGANISM	#formal_name Rattus norvegicus #common_name Norway rat		
DATE	21-May-1990 #sequence_revision 21-May-1990 #text_change 16-Jul-1999		
ACCESSIONS	A31674; S00876; S24309		
REFERENCE	A31674		
#authors	Shimasaki, S.; Emoto, N.; Koba, A.; Mercado, M.; Shibata, F.; Cooksey, K.; Baird, A.; Ling, N.		
#journal	Biochem. Biophys. Res. Commun. (1988) 157:256-263		
#title	Complementary DNA cloning and sequencing of rat ovarian basic fibroblast growth factor and tissue distribution study of its mRNA.		
#cross-references	MUID:R9061721		
#accession	A31674		
#molecule_type	mRNA		
#residues	1-154	##label SHI	
#cross-references	GB:M22427; NID:g204285; PIDN:AAA41210.1; PID:g204286		
REFERENCE	S00876		
#authors	Kurokawa, T.; Seno, M.; Igarashi, K.		
#journal	Nucleic Acids Res. (1988) 16:5201		
#title	Nucleotide sequence of rat basic fibroblast growth factor cDNA		
#cross-references	MUID:88262516		
#accession	S00876		
#molecule_type	mRNA		
#residues	1-154	##label KUR	
#cross-references	EMBL:X07285; NID:g56203; PIDN:CAA30265.1; PID:g56204		
REFERENCE	S24309		
#authors	Ei-Husseini, A.E.D.; Paterson, J.A.; Myal, Y.; Shiu, R.P.C.		
#journal	Biochim. Biophys. Acta (1992) 1131:314-316		

Search completed: Tue Aug 29 16:09:29 2000  
Job time : 17 secs.

\*\*\*\*\*  
W P S R L  
\*\*\*\*\* (TM)

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MPSrch\_pp protein - protein database search, using Smith-Waterman algorithm  
on: Tue Aug 29 16:06:59 2000; MasPar time 7.03 Seconds  
757.906 Million cell updates/sec  
Abular output not generated.

Title: >US-09-121-017B-25  
Description: ~~1242~~ from US09121017B.ppt  
Perfect Score: 1242  
Sequence: 1 MSRGAGRVQGTQLQALVFLGV.....PRTHYGQKAILFLPLPVSSD 172

Scoring table: PAM 150  
Gap 11

Searched: 85661 seqs, 30989116 residues

Post-processing: Minimum Match 0%  
Listing first 45 summaries

Database: swiss-prot38  
1:swissprot

Statistics: Mean 44.068; Variance 67.544; scale 0.652

Pred. No. is the number of results predicted by chance to have a  
score greater than or equal to the score of the result being printed,  
and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description	Pred. No.
1	985	79.3	155	1	FGF1_HUMAN HEPARIN-BINDING GROWTH	4.56e-226
2	968	77.9	155	1	FGF1_MESAU HEPARIN-BINDING GROWTH	1.85e-221
3	966	77.8	155	1	FGF1_MOUSE HEPARIN-BINDING GROWTH	6.43e-221
4	954	76.8	152	1	FGF1_PIG HEPARIN-BINDING GROWTH	1.14e-217
5	917	73.8	155	1	FGF1_BOVIN HEPARIN-BINDING GROWTH	1.16e-207
6	916	73.8	155	1	FGF1_CHICK HEPARIN-BINDING GROWTH	2.17e-207
7	531	42.8	158	1	FGF2_SHEEP HEPARIN-BINDING GROWTH	7.37e-105
8	529	42.6	155	1	FGF2_BOVIN HEPARIN-BINDING GROWTH	2.45e-104
9	525	42.3	155	1	FGF2_MOUSE HEPARIN-BINDING GROWTH	2.70e-103
10	518	41.7	155	1	FGF2_HUMAN HEPARIN-BINDING GROWTH	1.79e-101
11	513	41.3	154	1	FGF2_MOUSE HEPARIN-BINDING GROWTH	3.58e-100
12	513	41.3	154	1	FGF2_RAT HEPARIN-BINDING GROWTH	3.58e-100
13	500	40.3	155	1	FGF2_MONDO HEPARIN-BINDING GROWTH	8.48e-97
14	494	39.8	155	1	FGF2_XENLA HEPARIN-BINDING GROWTH	3.05e-95
15	475	38.2	137	1	FGF2_RABBIT GLIA-ACTIVATING FACTOR	2.49e-90
16	360	29.0	209	1	FGF9_XENLA GLIA-ACTIVATING FACTOR	4.50e-61
17	350	28.2	208	1	FGF9_HUMAN GLIA-ACTIVATING FACTOR	1.41e-58
18	350	28.2	208	1	FGF9_MOUSE GLIA-ACTIVATING FACTOR	1.41e-58
19	329	26.5	207	1	FGF6_HUMAN FIBROBLAST GROWTH FACT	2.28e-53
20	324	26.1	207	1	FGF6_RAT FIBROBLAST GROWTH FACT	3.90e-52
21	302	24.3	194	1	FGF7_SHEEP KERATINOCYTE GROWTH FA	9.58e-47
22	299	24.1	194	1	FGF7_HUMAN KERATINOCYTE GROWTH FA	5.15e-46

ALIGNMENTS

RESULT	1	FGF1_HUMAN	STANDARD;	PRT;	155 AA.
ID	AC	P05230; P07502;			
DT	DT	13-AUG-1987 (Rel. 05, Created)			
DT	DT	13-AUG-1987 (Rel. 05, Last sequence update)			
DT	DT	15-JUL-1999 (Rel. 38, Last annotation update)			
DE	DE	HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF) (BETA-ENDOTHELIAL CELL GROWTH FACTOR) (ECGF-BETA).			
GN	GN	FGF1 OR FGFA.			
OS	OS	Homo sapiens (Human).			
OC	OC	Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;			
OC	OC	Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.			
RN	RN	[1]			
RP	RP	SEQUENCE FROM N.A.			
RA	RA	Jaye M., Howk R., Burgess W., Ricca G.A., Chiu I.-M., Ravera M.W., O'Brien S.J., Modi W.S., Maciag T., Drohan W.N.;			
RT	RT	"Human endothelial cell growth factor: cloning, nucleotide sequence, and chromosome localization."			
RL	RL	Science 233:541-545(1986).			
RN	RN	[2]			
RP	RP	SEQUENCE FROM N.A.			
RC	RC	TISSUE=BRIN STEM;			
RX	RX	MEDLINE; 89343957.			
RA	RA	Wang W.P., Lehtoma K., Varban M.L., Krishnan I., Chiu I.M.;			
RT	RT	"Cloning of the gene coding for human class 1 heparin-binding growth factor and its expression in fetal tissues."			
RL	RL	Mol. Cell. Biol. 9:2387-2395(1989).			
RN	RN	[3]			
RP	RP	SEQUENCE FROM N.A.			
RC	RC	TISSUE=BRIN STEM;			
RX	RX	MEDLINE; 90265618.			
RA	RA	Chiu I.M., Wang W.P., Lehtoma K.;			
RT	RT	"Alternative splicing generates two forms of mRNA coding for human heparin-binding growth factor 1."			
RL	RL	Oncogene 5:755-762(1990).			
RN	RN	[4]			
RP	RP	SEQUENCE FROM N.A.			
RX	RX	MEDLINE; 90073637.			
RA	RA	Mergia A., Fischer E., Graves D., Tumolo A., Miller J.;			
RT	RT	Gospodarowicz D., Abraham J.A., Shipley G.D., Fiddes J.C.;			
RL	RL	"Structural analysis of the gene for human acidic fibroblast growth factor."			
RN	RN	[5]			
RP	RP	Biochem. Biophys. Res. Commun. 164:1121-1129(1989).			

24	295	23.8	194	1	FGF7_MOUSE KERATINOCYTE GROWTH FA	4.83e-45
25	288	23.2	187	1	FGFA_XENLA FIBROBLAST GROWTH FACT	2.40e-43
26	277	22.3	208	1	FGFA_HUMAN FIBROBLAST GROWTH FACT	1.07e-40
27	277	22.3	215	1	FGFA_RAT FIBROBLAST GROWTH FACT	1.07e-40
28	276	22.2	194	1	FGF4_CHICK FIBROBLAST GROWTH FACT	1.86e-40
29	275	22.1	192	1	FGFB_XENLA FIBROBLAST GROWTH FACT	3.24e-40
30	274	22.1	247	1	FGFE_MOUSE FIBROBLAST GROWTH FACT	5.62e-40
31	274	22.1	264	1	FGF5_MOUSE FIBROBLAST GROWTH FACT	5.62e-40
32	274	22.1	266	1	FGF5_RAT FIBROBLAST GROWTH FACT	5.62e-40
33	273	22.0	209	1	FGFA_MOUSE FIBROBLAST GROWTH FACT	9.76e-40
34	273	22.0	247	1	FGFE_HUMAN FIBROBLAST GROWTH FACT	9.76e-40
35	272	21.9	206	1	FGF4_BOVIN FIBROBLAST GROWTH FACT	1.69e-39
36	271	21.8	194	1	FGF7_RAT KERATINOCYTE GROWTH FA	2.94e-39
37	269	21.7	268	1	FGF5_HUMAN FIBROBLAST GROWTH FACT	8.83e-39
38	266	21.4	256	1	FGF3_BRARE FIBROBLAST GROWTH FACT	4.59e-38
39	263	21.2	225	1	FGFB_HUMAN FIBROBLAST GROWTH FACT	2.38e-37
40	257	20.7	225	1	FGFB_MOUSE FIBROBLAST GROWTH FACT	6.31e-36
41	256	20.6	243	1	FGFC_HUMAN FIBROBLAST GROWTH FACT	1.09e-35
42	255	20.5	206	1	FGF4_HUMAN FIBROBLAST GROWTH FACT	1.88e-35
43	253	20.4	208	1	FGF6_MOUSE FIBROBLAST GROWTH FACT	5.57e-35
44	248	20.0	208	1	FGF6_HUMAN FIBROBLAST GROWTH FACT	8.38e-34
45	248	20.0	245	1	FGFD_MOUSE FIBROBLAST GROWTH FACT	8.38e-34

RA MEDLINE; 92019819.  
RA Wang W.P., Quick D., Balcerzak S.P., Needleman S.W., Chiu I.M.;  
RT "Cloning and sequence analysis of the human acidic fibroblast growth  
RT factor gene and its preservation in leukemia patients.";  
RN Oncogene 6:1521-1529(1991).  
[6]  
RP SEQUENCE FROM N.A.  
RX MEDLINE; 92202857.  
RA Li Y.L., Kha H., Golden J.A., Migchielsen A.A.J., Goetzl E.J.,  
RA Turk E.J.; fibroblast growth factor protein generated by alternate  
RT splicing acts like an antagonist.;  
RT J. Exp. Med. 175:1073-1080(1992).  
[7]  
RP SEQUENCE OF 1-154 FROM N.A.  
RX MEDLINE; 94069734.  
RA Zhao X.M., Yeoh T.K., Hiebert M., Frist W.H., Miller G.G.;  
RA "The expression of acidic fibroblast growth factor (heparin-binding  
RT growth factor-1) and cytokine genes in human cardiac allografts and T  
RT cells.";  
RN Transplantation 56:1177-1182(1993).  
[8]  
RP SEQUENCE OF 1-40 FROM N.A.  
RX MEDLINE; 90365758.  
RA Crumley G., Dionne C.A., Jaye M.;  
RT "The gene for human acidic fibroblast growth factor encodes two  
RT upstream exons alternatively spliced to the first coding exon.;  
RL Biochem. Biophys. Res. Commun. 171:7-13(1990).  
[9]  
RP SEQUENCE OF 16-155.  
RX MEDLINE; 86296647.  
RA Harper J.W., Strydom D.J., Lobb R.R.;  
RT "Human class I heparin-binding growth factor: structure and homology  
RT to bovine acidic brain fibroblast growth factor.";  
RL Biochemistry 25:4097-4103(1986).  
[10]  
RP SEQUENCE OF 16-155.  
RX MEDLINE; 86295741.  
RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;  
RT "The complete amino acid sequence of human brain-derived acidic  
RT fibroblast growth factor.";  
RL Biochem. Biophys. Res. Commun. 138:611-617(1986).  
[11]  
RP SEQUENCE OF 16-155.  
RX MEDLINE; 87048871.  
RA Gautschi-Sova P., Mueller T., Boehlen P.;  
RT "Amino acid sequence of human acidic fibroblast growth factor.";  
RL Biochem. Biophys. Res. Commun. 140:874-880(1986).  
[12]  
RP SEQUENCE OF 16-47.  
RX MEDLINE; 86186784.  
RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;  
RT "Human brain-derived acidic and basic fibroblast growth factors:  
RT amino terminal sequences and specific mitogenic activities.";  
RL Biochem. Biophys. Res. Commun. 135:541-548(1986).  
[13]  
RP SEQUENCE OF 16-49.  
RX MEDLINE; 86275260.  
RA Gautschi P., Frater-Schroeder M., Boehlen P.;  
RT "Partial molecular characterization of endothelial cell mitogens from  
RT human brain: acidic and basic fibroblast growth factors.";  
RL FEBS Lett. 204:203-207(1986).  
[14]  
RP X-RAY CRYSTALLOGRAPHY (2.0 ANGSTROMS).  
RX MEDLINE; 96194129.  
RA Blaber M., Disalvo J., Thomas K.A.;  
RT "X-ray crystal structure of human acidic fibroblast growth factor.";  
RN Biochemistry 35:2086-2094(1996).  
[15]  
RP STRUCTURE BY NMR OF 24-155.  
RX MEDLINE; 94358885.  
RA Pineda-Lucena A., Gimenez M.A., Nieto J.L., Santoro J., Rico M.,  
RA Gimenez-Gallego G.;

RT "1H-NMR assignment and solution structure of human acidic fibroblast  
RT growth factor activated by inositol hexasulfate.";  
RL J. Mol. Biol. 242:81-98(1994).  
[16]  
RP STRUCTURE BY NMR OF 24-155.  
RX MEDLINE; 97107535.  
RA Pineda-Lucena A., Gimenez M.A., Lozano R.M., Nieto J.L., Santoro J.,  
RA Rico M., Gimenez-Gallego G.;  
RT "Three-dimensional structure of acidic fibroblast growth factor in  
RT solution: effects of binding to a heparin functional analog.";  
RL J. Mol. Biol. 264:162-178(1996).  
[17]  
RP STRUCTURE BY NMR OF 25-155.  
RX MEDLINE; 98387896.  
RA Lozano R.M., Jimenez M., Santoro J., Rico M., Gimenez-Gallego G.;  
RT "Solution structure of acidic fibroblast growth factor bound to 1,3,  
RT 6-naphthalenetrifluoride: a minimal model for the anti-tumoral  
RT action of suramin and suradistas.";  
RL J. Mol. Biol. 281:899-915(1998).  
CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -1- SUBUNIT: MONOMER.  
CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY  
CC THAN DOES BFGF.  
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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CC -----  
DR EMBL; M13361; AAA79245.1; -  
DR EMBL; X51943; CAA36206.1; -  
DR EMBL; M30492; AAA52446.1; -  
DR EMBL; M30490; AAA52446.1; JOINED.  
DR EMBL; M30491; AAA52446.1; JOINED.  
DR EMBL; M60515; AAA51672.1; -  
DR EMBL; M60516; AAA51673.1; -  
DR EMBL; M23087; AAA52638.1; -  
DR EMBL; M23086; AAA52638.1; JOINED.  
DR EMBL; S67291; AAB29057.1; -  
DR EMBL; X65778; CAA46661.1; -  
DR PIR; A23553; A23553.  
DR PIR; A24243; A24243.  
DR PIR; A24301; A24301.  
DR PIR; A24662; A24662.  
DR PIR; A24820; A24820.  
DR PIR; A26386; A26386.  
DR PIR; A33665; A33665.  
DR PIR; S18217; S18217.  
DR PDB; 2AFG; 15-OCT-95.  
DR PDB; 1AXM; 22-APR-98.  
DR PDB; 2AXM; 22-APR-98.  
DR PDB; 1RML; 11-NOV-98.  
DR MIM; 131220; -  
DR PFAM; PF00167; FGF; 1.  
DR PRINTS; PR00262; IL1HBGF.  
DR PRINTS; PR00263; HGFEGF.  
DR PROSITE; PS00247; HBGF\_FGF; 1.  
DR Growth factor; Mitogen; Vascularization; Heparin-binding; Acetylation;  
KW 3D-structure.  
FT PROPEP 1 15 HEPARIN-BINDING GROWTH FACTOR 1.  
FT CHAIN 16 155 ACETYLATION.  
FT MOD\_RES 2 2 HEPARIN (POTENTIAL).  
FT BINDING 24 28 HEPARIN (POTENTIAL).  
FT BINDING 113 116 HEPARIN (POTENTIAL).  
SQ SEQUENCE 155 AA; 17460 MW; F586E8BFB09F1580 CRC64;

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DR ENBL; X14232; CAA32448.1; --  
DR ENBL; M30641; AAA37618.1; --  
DR ENBL; U36459; AAC52969.1; --  
DR ENBL; U36457; AAC52969.1; JOINED.  
DR ENBL; U36458; AAC52969.1; JOINED.  
DR ENBL; U67610; AAC52907.1; --  
DR PIR; S04147; S04147.  
DR PIR; D37360; D37360.  
DR HSP; P05230; ZAXM.  
DR MGD; MG1:95515; FGF1.  
DR PFAM; PF00167; FGF; 1.  
DR PRINTS; PR00262; IL1HGEF.
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DR PRINTS: P00263; HBGF<sub>FGF</sub>  
 DR PROSITE: P00247; HBGF<sub>FGF</sub>; 1.  
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
 FT PROPEP 1 15  
 FT CHAIN 16 155 HEPARIN-BINDING GROWTH FACTOR 1.  
 FT BINDING 24 28 HEPARIN (POTENTIAL).  
 FT BINDING 113 116 HEPARIN (POTENTIAL).  
 SQ SEQUENCE 155 AA; 17418 MW; 8880E4FF0EBA4161 CRC64;  
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 Best Local Similarity 96.3%; Pred. No. 6.43e-221;  
 Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;  
 Db 21 GNKKPKLLYCSNGGHFLRLPDGTGTRDRSDQHIQLQLSAESAGEVIKSTETGOYL 80  
 QY 38 ANYKKPKLLYCSNGGHFLRLPDGTGTRDRSDQHIQLQLSAESAGEVIKSTETGOYL 97  
 Db 81 AMDTGGLYGSQTPNECLFLERLEENHYNTYTSKHAENWFWGLKKNCKRGPRTHY 140  
 QY 98 AMTDGLLYGSQTPNECLFLERLEENHYNTYTSKHAENWFWGLKKNCKRGPRTHY 157  
 Db 141 GQKAILFLPLVSSD 155  
 QY 158 GQKAILFLPLVSSD 172  
 RESULT 4  
 ID FGF1\_PIG STANDARD; PRT; 152 AA.  
 AC P20002;  
 DT 01-FEB-1991 (Rel. 17, Created)  
 DT 01-FEB-1996 (Rel. 33, Last sequence update)  
 DT 15-JUL-1999 (Rel. 38, Last annotation update)  
 DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST  
 DE GROWTH FACTOR) (AFGF) (ALPHA-ENDOTHELIAL CELL GROWTH FACTOR)  
 DE (FRAGMENT).  
 GN FGF1 OR FGF-1.  
 OS Sus scrofa (Pig).  
 OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Cetartiodactyla; Suina; Suidae; Sus.  
 RN [1]  
 RC TISSUE=HEART;  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 92062117.  
 RA Schmidt M., Sharma H.S., Schott R.J., Schaper W.;  
 RT "Amplification and sequencing of mRNA encoding acidic fibroblast  
 RT growth factor (aFGF) from porcine heart."  
 RL Biochem. Biophys. Res. Commun. 180:853-859(1991).  
 [2]  
 CC SEQUENCE OF 22-41.  
 CC MEDLINE; 89231704.  
 RA Quinkler W., Maasberg M., Bernotat-Danielowski S., Luethe N.,  
 RA Sharma H.S., Schaper W.;  
 RT "Isolation of heparin-binding growth factors from bovine, porcine and  
 RT canine hearts."  
 RL Eur. J. Biochem. 181:67-73(1989).  
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
 CC -!- SUBUNIT: MONOMER.  
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY  
 CC THAN DOES BGF.  
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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 CC -----  
 CC EMBL; X60317; CAA42869.1; -.

DR PIR: S03954; S03954.  
 DR HSSP; P05230; 2AXM.  
 DR PFAM; PF00167; FGF; 1.  
 DR PROSITE; P00247; HBGF<sub>FGF</sub>; 1.  
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
 FT PROPEP 1 15  
 FT CHAIN 16 >152 HEPARIN-BINDING GROWTH FACTOR 1.  
 FT CHAIN 22 >152 ENDOTHELIAL CELL GROWTH FACTOR ALPHA.  
 FT BINDING 24 28 HEPARIN (POTENTIAL).  
 FT BINDING 113 116 HEPARIN (POTENTIAL).  
 FT CONFLICT 31 31 C -> S (IN REF. 2).  
 FT CONFLICT 39 39 R -> Y (IN REF. 2).  
 FT NON\_TER 152 152  
 SQ SEQUENCE 152 AA; 17103 MW; AE853B0A92F9ABF4 CRC64;  
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 Best Local Similarity 96.2%; Pred. No. 1.14e-217;  
 Matches 128; Conservative 3; Mismatches 2; Indels 0; Gaps 0;  
 Db 20 PGNYKKPKLLYCSNGGHFLRLPDGTGTRDRSDQHIQLQLSAESAGEVIKSTETGOY 79  
 QY 37 SANYKKPKLLYCSNGGHFLRLPDGTGTRDRSDQHIQLQLSAESAGEVIKSTETGOY 96  
 Db 80 LAMDTGGLYGSQTPNECLFLERLEENHYNTYTSKHAENWFWGLKKNCKRGPRTH 139  
 QY 97 LAMTDGLLYGSQTPNECLFLERLEENHYNTYTSKHAENWFWGLKKNCKRGPRTH 156  
 Db 140 YGQKAILFLPLPV 152  
 QY 157 YGQKAILFLPLPV 169  
 RESULT 5  
 ID FGF1\_BOVIN STANDARD; PRT; 155 AA.  
 AC P03968;  
 DT 23-OCT-1986 (Rel. 02, Created)  
 DT 01-MAR-1989 (Rel. 10, Last sequence update)  
 DT 15-JUL-1999 (Rel. 38, Last annotation update)  
 DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST  
 DE GROWTH FACTOR) (AFGF) (PROSTATROPIN) (ENDOTHELIAL CELL GROWTH FACTOR  
 DE BETA AND ALPHA CHAINS) (ACIDIC EYE-DERIVED GROWTH FACTOR II) (EDGE  
 DE II).  
 GN FGF1 OR FGF-1 OR FGFA OR HBGF-1 OR AFGF.  
 OS Bos taurus (Bovine).  
 OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;  
 OC Bovidae; Bovinae; Bos.  
 RN [1]  
 RC TISSUE=RETINA;  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 89083506.  
 RA Halley C., Courtois Y., Laurent M.;  
 RT "Nucleotide sequence of bovine acidic fibroblast growth factor cdna."  
 RL Nucleic Acids Res. 16:10913-10913(1988).  
 RN [2]  
 RP SEQUENCE FROM N.A.  
 RC TISSUE=RETINA;  
 RX MEDLINE; 89078619.  
 RA Alterio J., Halley C., Brou C., Soussi T., Courtois Y., Laurent M.;  
 RT "Characterization of a bovine acidic FGF cdna clone and its  
 RT expression in brain and retina."  
 RL FEBS Lett. 242:41-46(1988).  
 RN [3]  
 RP SEQUENCE OF 2-155.  
 RX MEDLINE; 87016918.  
 RA Burgess W.H., Mehlman T., Marshak D.R., Fraser B.A., Maciag T.;  
 RT "Structural evidence that endothelial cell growth factor beta is the  
 RT precursor of both endothelial cell growth factor alpha and acidic  
 RT fibroblast growth factor."  
 RL Proc. Natl. Acad. Sci. U.S.A. 83:7216-7220(1986).  
 RN [4]  
 RP SEQUENCE OF 2-155.  
 RX MEDLINE; 87026586.

RA Crabb J.W., Ames L.G., Carr S.A., Johnson C.M., Roberts G.D.,  
 RA Bordoli R.S., McKeenhan W.L.;  
 RT "Complete primary structure of prostatropin, a prostate epithelial  
 RT cell growth factor";  
 RL Biochemistry 25:4988-4993(1986).  
 RN [5]  
 RP SEQUENCE OF 16-155.  
 RX MEDLINE: 86070224.  
 RA Gineez-Gallego G., Rodkey J., Bennett C., Rios-Candelore M.,  
 RA Disalvo J., Thomas K.;  
 RT "Brain-derived acidic fibroblast growth factor: complete amino acid  
 RT sequence and homologues";  
 RL Science 230:1385-1388(1985).  
 RN [6]  
 RP SEQUENCE OF 16-44, AND COMPOSITION.  
 RX MEDLINE: 86055750.  
 RA Boehlen P., Esch F., Baird A., Gospodarowicz D.;  
 RT "Acidic fibroblast growth factor (FGF) from bovine brain:  
 RT amino-terminal sequence and comparison with basic FGF";  
 RL EMBO J. 4:1951-1956(1985).  
 RN [7]  
 RP SEQUENCE OF 16-56 FROM N.A.  
 RX MEDLINE: 86261806.  
 RA Abraham J.A., Mergia A., Whang J.L., Tumolo A., Friedman J.,  
 RA Hjerrild K.A., Gospodarowicz D., Fiddes J.C.;  
 RT "Nucleotide sequence of a bovine clone encoding the angiogenic  
 RT protein, basic fibroblast growth factor";  
 RL Science 233:545-548(1986).  
 RN [8]  
 RP SEQUENCE OF 16-45.  
 RX MEDLINE: 89231704.  
 RA Quinkler W., Maasberg M., Bernotat-Danielowski S., Luethke N.,  
 RA Sharma H.S., Schaper W.;  
 RT "Isolation of heparin-binding growth factors from bovine, porcine and  
 RT canine hearts";  
 RL Eur. J. Biochem. 181:67-73(1989).  
 RN [9]  
 RP SEQUENCE OF 1-18 FROM N.A.  
 RX MEDLINE: 91095983.  
 RA Philippe J.M., Renaud F., Desset S., Laurent M.;  
 RL Submitted (JUL-1992) to the EMBL/GenBank/DBJ databases.  
 RN [10]  
 RP X-RAY CRYSTALLOGRAPHY (3.0 ANGSTROMS).  
 RX MEDLINE: 91095983.  
 RA Zhu X., Komiya H., Chirino A., Faham S., Fox G.M., Arakawa T.,  
 RA Hsu B.T., Rees D.C.;  
 RT "Three-dimensional structures of acidic and basic fibroblast growth  
 RT factors";  
 RL Science 251:90-93(1991).  
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
 CC -!- SUBUNIT: MONOMER.  
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY  
 CC THAN DOES BFGF.  
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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 DR EMBL: M13439; AAA30516.1; -;  
 DR EMBL: X13221; CAA31610.1; -;  
 DR EMBL: X14032; CAA32192.1; -;  
 DR EMBL: M35608; AAA30517.1; -;  
 DR EMBL: X66446; CAA47063.1; -;  
 DR EMBL: M97660; AAA30563.1; -;  
 DR EMBL: M97661; AAA30564.1; -;  
 DR PIR: A01385; GKBOA.

DR PIR: A25043; A25043.  
 DR PIR: B25043; B25043.  
 DR PIR: C25043; C25043.  
 DR PIR: A24777; A24777.  
 DR PIR: B24663; B24663.  
 DR PIR: S02102; S02102.  
 DR PDB: 1BAR; 31-OCT-93.  
 DR PDB: 1AFC; 31-OCT-93.  
 DR PFAM: PF00167; FGF; 1.  
 DR PRINTS: PR00262; ILLHGF.  
 DR PRINTS: PR00263; HBGFFGF.  
 DR PROSITE: PS00247; HBGF\_FGF; 1.  
 KW Growth factor; Mitogen; Vascularization; Heparin-binding; Acetylation;  
 KW 3D-structure.  
 FT PROPEP 1 15  
 FT CHAIN 2 155  
 FT CHAIN 16 155  
 FT CHAIN 22 155  
 FT MOD\_RES 2 2  
 FT BINDING 24 28  
 FT BINDING 113 116  
 FT STRAND 27 31  
 FT TURN 32 34  
 FT STRAND 37 40  
 FT TURN 42 43  
 FT STRAND 46 49  
 FT HELIX 55 57  
 FT STRAND 59 61  
 FT STRAND 69 69  
 FT STRAND 71 73  
 FT STRAND 79 82  
 FT TURN 84 85  
 FT STRAND 87 91  
 FT HELIX 96 98  
 FT STRAND 100 100  
 FT STRAND 103 104  
 FT TURN 106 107  
 FT STRAND 110 111  
 FT STRAND 113 114  
 FT TURN 116 121  
 FT STRAND 123 123  
 FT STRAND 126 126  
 FT TURN 128 129  
 FT STRAND 132 132  
 FT STRAND 134 134  
 FT STRAND 135 137  
 FT TURN 140 141  
 FT TURN 144 145  
 FT STRAND 147 150  
 SQ SEQUENCE 155 AA; 17493 MW; F636641F189F9BFD CRC64;  
 Query Match 73.8%; Score 917; DB 1; Length 155;  
 Best Local Similarity 91.9%; Pred. No. 1.16e-207;  
 Matches 124; Conservative 6; Mismatches 5; Indels 0; Gaps 0;  
 Db 21 GNYKPKLLYCSNGYFLRLPDGTVDGTDKDRSDOHLQQLCAESIGEVYIKSTGTGFL 80  
 Qy :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|  
 38 ANYKPKLLYCSNGHFLRLPDGTVDGTDKDRSDOHLQQLCAESVGEVYIKSTGTGOYL 97  
 Db 81 AMDTDGLLYGSQTNEECFLERLEENHNTYISKKAERHWFVGLKNGRSKLGPRTHF 140  
 Qy :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:  
 98 AMDTDGLLYGSQTNEECFLERLEENHNTYISKKAERHWFVGLKNGRSKLGPRTHF 157  
 Db 141 GQKAILFLPLPVSSD 155  
 Qy :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:  
 158 GQKAILFLPLPVSSD 172  
 RESULT 6  
 ID FGF1\_CHICK STANDARD; PRT; 155 AA.  
 AC P19596;  
 DT 01-FEB-1991 (Rel. 17, Created)  
 DT 01-FEB-1996 (Rel. 33, Last sequence update)









RX MEDLINE; 87156686.  
 RA Story M.T., Esch F., Shimasaki S., Sasse J., Jacobs S.C., Lawson R.K.;  
 RT "Amino-terminal sequence of a large form of basic fibroblast growth  
 RL factor isolated from human benign prostatic hyperplastic tissue";  
 RN Biochem. Biophys. Res. Commun. 142:702-709(1987).  
 RX X-RAY CRYSTALLOGRAPHY (2.2 ANGSTROMS).  
 RP MEDLINE; 91195367.  
 RA Eriksson A.E., Cousens L.S., Weaver L.H., Matthews B.W.;  
 RT "Three-dimensional structure of human basic fibroblast growth  
 RL factor";  
 RN Proc. Natl. Acad. Sci. U.S.A. 88:3441-3445(1991).  
 RX X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).  
 RP MEDLINE; 94004464.  
 RA Eriksson A.E., Cousens L.S., Matthews B.W.;  
 RT "Refinement of the structure of human basic fibroblast growth factor  
 RL at 1.6-A resolution and analysis of presumed heparin binding sites by  
 RN selenate substitution";  
 RX Protein Sci. 2:1274-1284(1993).  
 RP [11]  
 RX X-RAY CRYSTALLOGRAPHY (1.8 ANGSTROMS).  
 RP MEDLINE; 91195368.  
 RA Zhang J., Cousens L.S., Barr P.J., Sprang S.R.;  
 RT "Three-dimensional structure of human basic fibroblast growth factor,  
 RL a structural homolog of interleukin 1 beta";  
 RN Proc. Natl. Acad. Sci. U.S.A. 88:3446-3451(1991).  
 RX X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).  
 RP MEDLINE; 92121151.  
 RA Ago H., Kitagawa Y., Fujishima A., Matsura Y., Katsube Y.;  
 RT "Crystal structure of basic fibroblast growth factor at 1.6-A  
 RL resolution";  
 RN J. Biochem. 110:360-363(1991).  
 RX X-RAY CRYSTALLOGRAPHY (2.8 ANGSTROMS).  
 RP MEDLINE; 91095983.  
 RA Zhu X., Komiya H., Chirino A., Faham S., Fox G.M., Arakawa T.,  
 RT Hsu B.T., Rees D.C.;  
 RN "Three-dimensional structures of acidic and basic fibroblast growth  
 RL factors";  
 RX Science 251:90-93(1991).  
 RP [13]  
 RX STRUCTURE BY NMR.  
 RP MEDLINE; 97040521.  
 RA Moy F.J., Seddon A.P., Boehlen P., Powers R.;  
 RT "High-resolution solution structure of basic fibroblast growth factor  
 RL determined by multidimensional heteronuclear magnetic resonance  
 RN spectroscopy";  
 RX Biochemistry 35:13552-13561(1996).  
 CC -|- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
 CC -|- SUBUNIT: MONOMER.  
 CC -|- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES  
 CC AFGF.  
 CC -|- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
 CC  
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 CC or send an email to [license@sib-sib.ch](mailto:license@sib-sib.ch)).  
 CC  
 CC ENBL; M17599; AAA52534.1; ALT\_INIT.  
 DR ENBL; X04431; CAA28027.1; .  
 DR ENBL; X04432; CAA28028.1; .  
 DR ENBL; X04433; CAA28029.1; .  
 DR ENBL; M27968; AAA52448.1; .  
 DR ENBL; J04513; AAA52533.1; ALT\_INIT.

DR PIR; A25824; A25824.  
 DR PIR; A26642; A26642.  
 DR PIR; B24243; B24243.  
 DR PIR; B24301; B24301.  
 DR PIR; B32878; B32878.  
 DR PIR; S00297; S00297.  
 DR PDB; 2FGF; 15-APR-92.  
 DR PDB; 4FGF; 15-JUL-93.  
 DR PDB; 1FGA; 15-JUL-93.  
 DR PDB; 1BFB; 03-APR-96.  
 DR PDB; 1BFC; 03-APR-96.  
 DR PDB; 1BFF; 16-JUN-97.  
 DR PDB; 1BFG; 31-JAN-94.  
 DR PDB; 2BFH; 30-APR-94.  
 DR PDB; 1BLA; 08-NOV-96.  
 DR PDB; 1BLD; 08-NOV-96.  
 DR MIM; 134920; .  
 DR PFAM; PF00167; FGF; 1.  
 DR PRINTS; PR00262; ILLHGGF.  
 DR PRINTS; PR00263; HBGGFGF.  
 DR PROSITE; PS00247; HBGF\_FGF; 1.  
 KW Growth factor; Mitogen; Vascularization; Heparin-binding;  
 KW 3D-structure.  
 FT PROPEP 1 9  
 FT CHAIN 10 135 HEPARIN-BINDING GROWTH FACTOR 2.  
 FT SITE 46 48 CELL ATTACHMENT SITE (POTENTIAL).  
 FT SITE 88 90 CELL ATTACHMENT SITE (POTENTIAL).  
 FT BINDING 27 31 HEPARIN (POTENTIAL).  
 FT BINDING 116 119 HEPARIN (POTENTIAL).  
 FT STRAND 30 34  
 FT TURN 35 38  
 FT STRAND 39 43  
 FT TURN 45 46  
 FT STRAND 49 52  
 FT TURN 55 56  
 FT HELIX 58 60  
 FT STRAND 62 66  
 FT TURN 69 70  
 FT STRAND 71 76  
 FT TURN 77 80  
 FT STRAND 81 85  
 FT TURN 87 88  
 FT STRAND 91 94  
 FT HELIX 99 101  
 FT STRAND 103 107  
 FT TURN 109 110  
 FT STRAND 113 117  
 FT TURN 121 122  
 FT STRAND 124 124  
 FT STRAND 127 127  
 FT TURN 129 130  
 FT STRAND 132 133  
 FT HELIX 136 138  
 FT TURN 141 142  
 FT HELIX 144 146  
 FT STRAND 148 152  
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 Query Match 41.7%; Score 518; DB 1; Length 155;  
 Best Local Similarity 52.1%; Pred. No. 1.79e-101;  
 Matches 76; Conservative 27; Mismatches 41; Indels 2; Gaps 1;  
 Db 12 LPDGGSGAFPGCHFKDPRKLYCKNGGFLRHPDGRVDGVRKSPHIKQLQAERG 71  
 QY 26 VPSAGARANGSANYKKPKLLYCSNGGHFLRILPDGTVDTGDRSDQHIQLQSAESVGE 85  
 Db 72 VSTKGVCAKRYLAWKEDGRLLASKCVTDCEFFERLESNNYTRSRKYT--SWYVALKR 129  
 QY 86 VYIKSTETQYLLAMDTDGLLYGSQTNEECFLERLEENHNTYISKRAENWVGLKK 145  
 Db 130 TGOYKLGSKITPGQKAILFLPMSAKS 155  
 QY 146 NGSKRGPRTHYGOKAILFLPLPVSS 171

```

RESULT 11
ID FGF2_MOUSE STANDARD; PRT; 154 AA.
AC P15655;
DT 01-APR-1990 (Rel. 14, Created)
DT 01-APR-1990 (Rel. 14, Last sequence update)
DT 01-FEB-1996 (Rel. 33, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).
GN FGF2 OR FGF-2.
OS Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
RN [1]
RP SEQUENCE FROM N.A.
RC MEDLINE; 90201563.
RX Hebert J.M., Basilico C., Goldfarb M., Haub O., Martin G.R.;
RA "Isolation of cDNAs encoding four mouse FGF family members and
RA characterization of their expression patterns during embryogenesis."
RA Dev. Biol. 138:454-463(1990).
CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -1- SUBUNIT: MONOMER.
CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC AFGF.
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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CC or send an email to license@isb-sib.ch).
CC EMBL; M30644; AAA37621.1; -
CC PIR; C37360; C37360.
CC HSD; P09038; 1BFF.
CC MGD; MGI:95516; FGF2.
CC PFAM; PF00167; FGF; 1.
CC PRINTS; PR00262; IL1HBGF.
CC PRINTS; PR00263; HBGF-FGF.
CC PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 9
CHAIN 10 154
BINDING 26 30 HEPARIN-BINDING GROWTH FACTOR 2.
BINDING 115 118 HEPARIN (POTENTIAL).
SQ SEQUENCE 154 AA; 17153 MW; 689F677416274388 CRC64;

Query Match
Best Local Similarity 52.7%; Pred. No. 3.58e-100;
Matches 77; Conservative 26; Mismatches 40; Indels 3; Gaps 2;

Db 12 LPEDEGA-AFPQGHFKDKRLCKNGGFLRTHPDGVDGVRKSDPHVYKQLQAEERG 70
QY : ||| : : : ||| ||| ||| ||| ||| ||| : : : ||| : ||| |||
26 VPSAGARANGSANYKKPKLLYCSNGGHLRLPDGTGDRDRSDQHLQLSAESVGE 85
Db 71 VSLKGVCANRYLAKMKGDRLLASKCVTECFEERLESNNYNTYRSKYS--SWYVALKR 128
QY : ||| : : : ||| ||| ||| ||| ||| ||| ||| ||| : : : ||| : |||
86 VIKSTETQYLAAMDYDGLLYGSQTPNECLFLERLEENHYNTYISKKHAENKWFVGLKK 145
Db 129 TGQYKLGSKTGPKQKAILFLPMSAKS 154
QY : ||| : : : ||| ||| ||| ||| ||| ||| ||| ||| : : : ||| : |||
146 NSCKRGPETHYQKAILFLPVS 171

RESULT 12
ID FGF2_RAT STANDARD; PRT; 154 AA.
AC P13109;
DT 01-JAN-1990 (Rel. 13, Created)
DT 01-JAN-1990 (Rel. 13, Last sequence update)
DT 13-JUL-1998 (Rel. 36, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).
GN FGF2 OR FGF-2.
OS Rattus norvegicus (Rat).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.
RN [1]
RP SEQUENCE FROM N.A.
RC STRAIN-SPRAGUE-DAWLEY; TISSUE-OVARY;
RX MEDLINE; 89061721.
RA Shimazaki S., Emoto N., Koba A., Mercado M., Shibata F.,
RA Cooksey K., Baird A., Ling N.;
RA "Complementary DNA cloning and sequencing of rat ovarian basic
RA fibroblast growth factor and tissue distribution study of its mRNA."
RA Biochem. Biophys. Res. Commun. 157:256-263(1988).
RN [2]
RP SEQUENCE FROM N.A.
RC TISSUE-BRAIN;
RX MEDLINE; 88262516.
RA Kurokawa T., Seno M., Igarashi K.;
RA "Nucleotide sequence of rat basic fibroblast growth factor cDNA."
RA Nucleic Acids Res. 16:5201-5201(1988).
RN [3]
RP SEQUENCE OF 1-28 FROM N.A.
RC STRAIN-SPRAGUE-DAWLEY; TISSUE-TESTIS;
RX MEDLINE; 97200905.
RA Pasumarthi K.B.S., Jin Y., Cattini P.A.;
RA "Cloning of the rat fibroblast growth factor-2 promoter region and
RA its response to mitogenic stimuli in glioma C6 cells."
RA J. Neurochem. 68:898-908(1997).
RN [4]
RP SEQUENCE OF 35-154 FROM N.A.
RC STRAIN-SPRAGUE-DAWLEY; TISSUE-BRAIN;
RX MEDLINE; 92329546.
RA El-Husseini A.E.D., Paterson J.A., Myal Y., Shiu R.P.C.;
RA "PCR detection of the rat brain basic fibroblast growth factor (bFGF)
RA mRNA containing a unique 3' untranslated region."
RA Blochm. Biophys. Acta 1131:314-316(1992).
CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -1- SUBUNIT: MONOMER.
CC -1- TISSUE SPECIFICITY: FOUND IN ALL THE TISSUES EXAMINED.
CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC AFGF.
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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CC or send an email to license@isb-sib.ch).
CC EMBL; M22427; AAA41210.1; -
CC EMBL; X07285; CAA30265.1; -
CC EMBL; U78079; AAC53225.1; -
CC EMBL; X61697; CAA43863.1; -
CC PIR; S00876; S00876.
CC PIR; A31674; A31674.
CC HSSP; P09038; 1BFF.
CC PFAM; PF00167; FGF; 1.
CC PRINTS; PR00262; IL1HBGF.
CC PRINTS; PR00263; HBGF-FGF.
CC PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 9
CHAIN 10 154
BINDING 26 30 HEPARIN-BINDING GROWTH FACTOR 2.
BINDING 115 118 HEPARIN (POTENTIAL).
SQ SEQUENCE 154 AA; 17153 MW; 689F677416274388 CRC64;

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FT BINDING 26 30 HEPARIN (POTENTIAL).  
FT BINDING 115 118 HEPARIN (POTENTIAL).  
SQ SEQUENCE 154 AA: 17139 MW; 1A0F14FF423D8403 CRC64;

Query Match 41.3%; Score 513; DB 1; Length 154;  
Best Local Similarity 49.7%; Pred. No. 3.58e-100;  
Matches 76; Conservative 29; Mismatches 46; Indels 2; Gaps 1;

Db 4 GSITSLPALPEGGAGFPKPKRYCKNGGFFLRHPDGRVDGVRKSDPHVKLQL 63  
QY 19 GVLGVWVPSAGARANGSANYKKKLLYCSNGHFLRLPDGTGTRDSQHIQQL 78  
Db 64 QAERGVSIVKGVANRYLAMEDEGLASKVTECFERLESNNYTSRKYSS--S 121  
QY 79 SAESVGEVYIKSTGTQYLLDGLLYGSPNEECFLERLEENHYNTYISKHAEN 138  
Db 122 WYVALKRTQYKLGSKTGPQKAILFLPMSAKS 154  
QY 139 WFGVLKNGSCRRGRPRHYGQKAILFLPLPVSS 171

RESULT 13  
ID FGF2 MONDO STANDARD; PRT; 156 AA.  
AC P48798;  
DT 01-FEB-1996 (Rel. 33, Created)  
DT 01-FEB-1996 (Rel. 33, Last sequence update)  
DT 01-NOV-1997 (Rel. 35, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF) (PROSTATROPIN).  
GN FGF2.  
OS Monodelphis domestica (Short-tailed grey opossum).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Mammalia; Metatheria; Didelphimorphia; Didelphidae; Monodelphis.  
RN [1]  
RP SEQUENCE FROM N.A.  
RC TISSUE-EYE;  
RX MEDLINE; 94296558.  
RA Kusewitt D.F., Sabourin C.L.K., Sherburn T.E., Ley R.D.;  
RT "Characterization of cDNA encoding basic fibroblast growth factor of the marsupial Monodelphis domestica";  
RL DNA Cell Biol. 13:549-554(1994).  
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -!- SUBUNIT: MONOMER.  
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES AFGF.  
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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CC  
CC EMBL; Z15154; CAA78854.1; ALT\_INIT.  
CC HSP; P09038; IBEF.  
CC PFAM; PF00167; FGF; 1.  
CC PRINTS; PR00262; ILIHGFG.  
CC PRINTS; PR00263; HBGFFGF.  
CC PROSITE; PS00247; HBGF\_FGF; 1.  
CC Growth factor; Mitogen; Vascularization; Heparin-binding.  
CC PROPEP 1 9 BY SIMILARITY.  
CC CHAIN 10 156 HEPARIN-BINDING GROWTH FACTOR 2.  
CC BINDING 28 32 HEPARIN (POTENTIAL).  
CC BINDING 117 120 HEPARIN (POTENTIAL).  
SQ SEQUENCE 156 AA; 17303 MW; 7E655FCC49BF1209 CRC64;

Query Match 40.3%; Score 500; DB 1; Length 156;  
Best Local Similarity 52.8%; Pred. No. 8.48e-97;

Matches 75; Conservative 25; Mismatches 40; Indels 2; Gaps 1;

Db 17 GGGAFPPGKPKRYCKNGGFFLRHPDGRVDGVRKSDPHVKLQLOAERGWSIK 76  
QY 30 AGARANGSANYKKKLLYCSNGHFLRLPDGTGTRDSQHIQQLSAESGEVYIK 89  
Db 77 GVCANRYLAMEDEGLALKVYTECFERLESNNYTSRKYSS--NWYVALKRTQY 134  
QY 90 STGTQYLLDGLLYGSPNEECFLERLEENHYNTYISKHAENWFGVLKNGSC 149  
Db 135 KLGSKTGPQKAILFLPMSAKS 156  
QY 150 KRGRTHYGQKAILFLPLPVSS 171

RESULT 14  
ID FGF2\_XENLA STANDARD; PRT; 155 AA.  
AC P12226;  
DT 01-OCT-1989 (Rel. 12, Created)  
DT 01-JAN-1990 (Rel. 13, Last sequence update)  
DT 01-NOV-1997 (Rel. 35, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF).  
GN FGF2 OR FGF-2.  
OS Xenopus laevis (African clawed frog).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Amphibia; Batrachia; Anura; Mesobatrachia; Pipidae; Pipidae;  
OC Xenopodinae; Xenopus.  
RN [1]  
RP SEQUENCE FROM N.A.  
RX MEDLINE; 89058621.  
RA Kimmelman D., Abraham J., Haaparanta T., Palisi T., Kirschner M.;  
RT "The presence of fibroblast growth factor in the frog egg: its role as a natural mesoderm inducer";  
RL Science 242:1053-1056(1988).  
RN [2]  
RP SEQUENCE OF 95-155 FROM N.A.  
RX MEDLINE; 88052890.  
RA Kimmelman D., Kirschner M.;  
RT "Synergistic induction of mesoderm by FGF and TGF-beta and the identification of an mRNA coding for FGF in the early Xenopus embryo";  
RL Cell 51:869-877(1987).  
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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CC  
CC EMBL; M18067; AAA49726.1;  
CC PIR; A29618; A29618.  
CC PIR; A40117; A40117.  
CC HSP; P09038; IBEF.  
CC PFAM; PF00167; FGF; 1.  
CC PRINTS; PR00262; ILIHGFG.  
CC PRINTS; PR00263; HBGFFGF.  
CC PROSITE; PS00247; HBGF\_FGF; 1.  
CC Growth factor; Mitogen; Vascularization; Heparin-binding.  
CC PROPEP 1 9  
CC CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.  
CC BINDING 27 31 HEPARIN (POTENTIAL).  
CC BINDING 116 119 HEPARIN (POTENTIAL).  
CC CONFLICT 111 111 MISSING (IN REF. 2).  
SQ SEQUENCE 155 AA; 17241 MW; 036735C8063142FD CRC64;

Query Match 39.8%; Score 494; DB 1; Length 155;  
Best Local Similarity 48.1%; Pred. No. 3.05e-95;  
Matches 74; Conservative 30; Mismatches 47; Indels 3; Gaps 2;

Db 4 GSITLTPTSESDGNTFFSPGSKDKRLKCKNGGFFLRINSGRVDGSRKSDSHIKLQ 63  
QY 19 GVLGVMPVSPAGARAN-GSANYKKPKLLYCSNGHGFLRLPDGTVGDRSDQHIQLQ 77  
Db 64 LOAVERGVSIKIGITANRYLAKMEDGRSLRCLTDECFFERKEANNNTYRSRYS-- 121  
QY 78 LSAESVGEVIKSTGQYLAQMDTGILYGSQTPNEECFLERLEENHYNTYISKHAEK 137  
Db 122 SWYVAKRGTGQYKNGSGTGPQKAILFLPMSAKS 155  
QY 138 NWFVGLKNGSCRGPRTHYQKAILFLPVPSS 171

RESULT 15  
ID FGF2\_RABIT STANDARD; PRT; 137 AA.  
AC P48739;  
DT 01-FEB-1996 (Rel. 33, Created)  
DT 01-FEB-1996 (Rel. 33, Last sequence update)  
DT 01-FEB-1996 (Rel. 33, Last annotation update)  
DT HEPARIN-BINDING GROWTH FACTOR 2 (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BEGF) (PROSTATROPIN) (FRAGMENT).  
QY FGF2.  
OS Oryctolagus cuniculus (Rabbit).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Lagomorpha; Leporidae; Oryctolagus.  
RN [1]  
RP SEQUENCE FROM N.A.  
RC STRAIN-NEW ZEALAND WHITE; TISSUE-SMOOTH MUSCLE;  
RX MEDLINE; 93343209.  
RA Winkles J.A., Friesel R., Alberts G.F., Janat M.F., Liau G.;  
RT "Elevated expression of basic fibroblast growth factor in an immortalized rabbit smooth muscle cell line";  
RL Am. J. Pathol. 143:518-527(1993).  
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -!- SUBUNIT: MONOMER.  
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES AFGF.  
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
CC This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation - the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See <http://www.isb-sib.ch/announce/> or send an email to [license@isb-sib.ch](mailto:license@isb-sib.ch)).  
EMBL; L12034; AAA31248.1;  
DR HSSP; P09038; 1BFF.  
DR PFAM; PF00167; FGF; 1.  
DR PROSITE; PS00247; HBGF\_FGF; 1.  
KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
FT BINDING 18 22 HEPARIN (POTENTIAL).  
FT BINDING 107 110 HEPARIN (POTENTIAL).  
FT NON\_TER 137 137  
SQ SEQUENCE 137 AA; 15418 MW; 0D9EE457B88E8C51 CRC64;

Query Match 38.2%; Score 475; DB 1; Length 137;  
Best Local Similarity 51.8%; Pred. No. 2.49e-90;  
Matches 71; Conservative 25; Mismatches 39; Indels 2; Gaps 1;  
Db 3 LPEDGGGAPPPGKPKLYCKNGGFFLRINHPDGVGVRKSDPHIKLQQAERG 62  
QY 26 VPSAGARANGSANYKKPKLLYCSNGHGFLRLPDGTVGDRSDQHIQLSAESVGE 85  
Db 63 VSIKGVCANRYLAKMEDGRLLSKCVTDECFFERLESNNNTYRSRYS--SWYVALKR 120  
QY 86 VYKSTETGQYLAQMDTGILYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKK 145  
Db 121 TGQYKLGSKTGPQKAI 137

QY 146 NGSKRGPRTHYQKAI 162  
Search completed: Tue Aug 29 16:07:31 2000  
Job time : 32 secs.

\*\*\*\*\*  
M O S R E H  
\*\*\*\*\*  
(TM)

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MPsrch\_pp protein - protein database search, using Smith-Waterman algorithm

on: Tue Aug 29 16:07:49 2000; Maspar time 16.22 seconds  
Similar output not generated. 735.228 Million cell updates/sec

Title: >US-09-121-017B-25  
Description: (1-172) from US09121017B.pep  
Perfect Score: 1242  
Sequence: 1 MSRGAGRVQCTLQALVFLGV.....PRTHYGOKAILFLPLPVSSD 172

Scoring table: PAM 150  
Gap 11

Searched: 225878 seqs, 69334122 residues

Post-processing: Minimum Match 0%  
Listing first 45 summaries

Database: sptrembl12

1:sp.archaea 2:sp.bacteria 3:sp.fungi 4:sp.human  
5:sp.invertebrate 6:sp.mammal 7:sp.mhc 8:sp.organelle  
9:sp.phage 10:sp.plant 11:sp.rodent 12:sp.unclassified  
13:sp.invertebrate 14:sp.virus

Statistics: Mean 42.894; Variance 68.754; scale 0.624

Pred. No. is the number of results predicted by chance to have a  
score greater than or equal to the score of the result being printed,  
and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Match	Length	ID	Description	Pred. No.
1	518	41.7	196	4	P78443	21 KD BASIC FIBROBLAST
2	511	41.1	130	6	O77767	BASIC FIBROBLAST GROW
3	382	30.8	101	13	P79706	BASIC FGF (FRAGMENT)
4	346	27.9	146	13	Q07659	FIBROBLAST GROWTH FACT
5	313	25.2	115	11	Q60487	BASIC FIBROBLAST GROW
6	301	24.2	194	6	P79150	KERATINOCYTE GROWTH FA
7	289	23.3	212	13	O42407	FIBROBLAST GROWTH FACT
8	274	22.1	252	11	O89096	PHF-48
9	266	21.4	60	4	Q16588	ACIDIC FIBROBLAST GROW
10	265	21.3	59	4	Q16089	ACIDIC FIBROBLAST GROW
11	264	21.3	70	11	O54837	FIBROBLAST GROWTH FACT
12	260	20.9	196	13	O9VH31	POTENTIAL FIBROBLAST GR
13	257	20.7	243	13	Q9W6A1	FIBROBLAST GROWTH FACT
14	251	20.2	127	4	O99517	FIBROBLAST GROWTH FACT
15	250	20.1	206	13	O9YGD8	FIBROBLAST GROWTH FACT
16	248	20.0	192	4	O9S830	FIBROBLAST GROWTH FACT
17	248	20.0	245	13	Q9W6A2	FIBROBLAST GROWTH FACT
18	236	19.0	200	13	P79925	FIBROBLAST GROWTH FACT
19	226	18.2	425	5	O76831	LET-756 PROTEIN.
20	225	18.1	74	6	O77561	KERATINOCYTE GROWTH FA

21	223	18.0	204	13	Q90696	FIBROBLAST GROWTH FACT	9.35e-27
22	222	17.9	210	13	O57341	FIBROBLAST GROWTH FACT	1.56e-26
23	217	17.5	770	5	P91672	FGF HOMOLOG	1.97e-25
24	213	17.1	244	4	Q14915	FIBROBLAST GROWTH FACT	1.48e-24
25	209	16.8	210	13	O42278	FIBROBLAST GROWTH FACT	1.11e-23
26	207	16.7	129	4	O60371	R33683_2	3.02e-23
27	200	16.1	285	14	Q9YMH2	FIBROBLAST GROWTH FACT	9.91e-22
28	198	15.9	182	14	O92401	FGF-ACHNPV ORF32	2.67e-21
29	190	15.3	114	4	O00527	BASIC FIBROBLAST GROW	1.37e-19
30	190	15.3	114	4	Q16443	BASIC FIBROBLAST GROW	1.37e-19
31	187	15.1	216	4	O95750	FGF-19	5.94e-19
32	183	14.7	73	6	O97573	FIBROBLAST GROWTH FACT	4.16e-18
33	157	12.6	78	11	O35340	FIBROBLAST GROWTH FACT	9.32e-13
34	116	9.3	82	6	O62682	FIBROBLAST GROWTH FACT	5.60e-05
35	112	9.0	86	13	P79685	FIBROBLAST GROWTH FACT	2.80e-04
36	110	8.9	822	1	O27154	CONSERVED PROTEIN.	6.20e-04
37	102	8.2	243	14	O73554	HYPOTHETICAL 27.5 KD P	1.36e-02
38	101	8.1	211	1	O9YEE7	211AA LONG HYPOTHETICA	1.99e-02
39	101	8.1	569	5	O25978	MAJOR MEROZOITE SURFAC	1.99e-02
40	101	8.1	569	5	O25983	MAJOR MEROZOITE SURFAC	1.99e-02
41	101	8.1	651	5	O25924	MEROZOITE SURFACE ANTI	1.99e-02
42	101	8.1	1720	5	O25922	PRECURSOR OF THE MAJOR	1.99e-02
43	99	8.0	569	5	O25979	MAJOR MEROZOITE SURFAC	4.19e-02
44	99	8.0	569	5	O25970	MAJOR MEROZOITE SURFAC	4.19e-02
45	99	8.0	569	5	O25977	MAJOR MEROZOITE SURFAC	4.19e-02

ALIGNMENTS

RESULT	1	PRELIMINARY;	PRT;	196 AA.
ID	P78443			
AC	P78443;			
DT	01-MAY-1997 (Tremblrel. 03, Created)			
DT	01-MAY-1997 (Tremblrel. 03, Last sequence update)			
DT	01-NOV-1999 (Tremblrel. 12, Last annotation update)			
DE	21 KD BASIC FIBROBLAST GROWTH FACTOR (BFGF).			
GN	FGF2.			
OS	Homo sapiens (Human).			
OC	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;			
OC	Eucheria; Primates; Catarrhini; Hominidae; Homo.			
RP	SEQUENCE FROM N.A.			
RA	MEDLINE; 89184522.			
RA	PRATS H., KACHAD M., PRATS A.C., KLAGSBRUN M., LELIAS J.M.,			
RA	LIAUZUN P., CHALON P., TAUBER J.P., AMALRIC F., SMITH J.A., CAPUT D.;			
RT	"High molecular mass forms of basic fibroblast growth factor are			
RT	initiated by alternative CUG codons."			
RL	Proc. Natl. Acad. Sci. U.S.A. 86:1836-1840(1989).			
RN	[2]			
RP	SEQUENCE OF 81-168 FROM N.A.			
RP	MEDLINE; 93038550.			
RA	WATSON R., ANTHONY F., PICKETT M., LAMBDEN P., MASSON G.M.,			
RA	THOMAS E.J.;			
RT	"Reverse transcription with nested polymerase chain reaction shows			
RT	expression of basic fibroblast growth factor transcripts in human			
RT	granulosa and cumulus cells from in vitro fertilisation patients."			
RL	Biochem. Biophys. Res. Commun. 187:1227-1231(1992).			
DR	EMBL; J04513; AAA52532.1; -			
DR	EMBL; S47380; AAD13853.1; -			
DR	HSSP; P09038; 1BFF.			
DR	PROSITE; PS00247; HBGF_FGF; 1.			
DR	PFAM; PF00167; FGF; 1.			
DR	PRINTS; PR00262; ILHBGF.			
DR	PRINTS; PR00263; HBGF_FGF.			
SQ	SEQUENCE 196 AA; 21203 MW; 49B75E39 CRC32;			
Query Match 41.7%; Score 518; DB 4; Length 19;				
Best Local Similarity 52.1%; Pred. No. 2.61e-97;				
Matches 76; Conservative 27; Mismatches 41; Indel: 2; Gaps 1;				
Db	53	LPEDGGGAFPPGHKDPKRLYCKNGGFFLRHPDGRVDGVREKSDPHK.LQLAQEERGV	112	
Oy	26	VPSAGARANGSANYKKPKLLYCSNGGHLPLDGTVDGTRDSRQHIQ.LQLSAESVGE	85	

Db 113 VSIKGVCANRYLAWKEDGRLLASKCVTDCEFFERLESNNYTYRSKYT--SWYVALKR 170  
 QY 86 VYKSTGTGYLAWMDTDLGLYGSQTNEECFLERLEENHNTYISKKHAENWFVGLKK 145

Db 171 TGOYKLGSKTGPQOKAILFLPMSAKS 196

QY 146 NGSKRGPRTHYGOKAILFLPLPVSS 171

RESULT 2  
 ID Q7767 PRELIMINARY; PRT; 130 AA.

AC Q7767;

DT 01-NOV-1998 (TREMELrel. 08, Created)

DT 01-NOV-1998 (TREMELrel. 08, Last sequence update)

DT 01-NOV-1999 (TREMELrel. 12, Last annotation update)

DE BASIC FIBROBLAST GROWTH FACTOR (FRAGMENT).

GN BFGF.

OS Canis familiaris (Dog).

OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;

Eutheria; Carnivora; Fissipedia; Canidae; Canis.

RN [1]

RP SEQUENCE FROM N.A.

RC TISSUE-ADRENAL GLAND;

RA TROCHTA O.A., JACOBS R.M., LAMARRE J.;

RT "The role bFGF in canine Hemangiosarcoma";

RL Submitted (APR-1998) to the EMBL/GenBank/DBJ databases.

DR EMBL; AF060562; AAC35912.1; -

DR HSSP; P09038; 1BF.

DR PROSITE; PS00247; HBGF\_FGF; 1.

DR PFAM; PF00167; FGF; 1.

FT NON\_TER 1

FT NON\_TER 130

FT SEQUENCE 130 AA; 14902 MW; DB6A90A4 CRC32;

Query Match 41.1%; Score 511; DB 6; Length 130;  
 Best Local Similarity 55.3%; Pred. No. 1.45e-95;  
 Matches 73; Conservative 21; Mismatches 36; Indels 2; Gaps 1;

Db 1 FKDPKRLKNGGFFRIHPDGRVDGVREKSDPHVKLQQAERGVSIGVCANRYLAM 60

QY 40 YKPKLLYCSNGHFLRILPDGTVDRSDQHILQLSAESVGEVYIKSTGTGYLAM 99

Db 61 KEDGRLLASKCVTDCEFFERLESNNYTYRSKYT--SWYVALKRGTQYKLGPKTGPQ 118

QY 100 DTGLYGSQTNEECFLERLEENHNTYISKKHAENWFVGLKNGSKRGPRTHYGQ 159

119 KAILFLPMSAKS 130

160 KAILFLPLPVSS 171

RESULT 3  
 ID P79706 PRELIMINARY; PRT; 101 AA.

AC P79706;

DT 01-MAY-1997 (TREMELrel. 03, Created)

DT 01-MAY-1997 (TREMELrel. 03, Last sequence update)

DT 01-NOV-1999 (TREMELrel. 12, Last annotation update)

DE BASIC FGF (FRAGMENT).

OS Cynops pyrrhogaster (Japanese common newt).

OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Amphibia;

OC Batrachia; Caudata; Salamandroidea; Salamandridae; Cynops.

RN [1]

RP SEQUENCE FROM N.A.

RC TISSUE-EMBRYO;

RA SUZUKI A.S., TABATA T., SAKAGUCHI K., TAKABATAKE T., TAKESHIMA K.,

RA KANEDA T.;

RT "Serial expression of the genes in a mesodermizing ectoderms of

early Cynops gastrula";

RL Submitted (NOV-1996) to the EMBL/GenBank/DBJ databases.

DR EMBL; D89443; BAAL3958.1; -

DR HSSP; P09038; 2BFH.

DR PROSITE; PS00247; HBGF\_FGF; 1.

DR PFAM; PF00167; FGF; 1.  
 FT NON\_TER 1  
 FT NON\_TER 101  
 FT SEQUENCE 101 AA; 11907 MW; 1CD93BB0 CRC32;

Query Match 30.8%; Score 382; DB 13; Length 101;  
 Best Local Similarity 53.4%; Pred. No. 7.46e-64;

Matches 55; Conservative 18; Mismatches 28; Indels 2; Gaps 1;

Db 1 PRRLCKNGGFFLRINSKGVDGAREKSDSYIKLQQAERGVSIGVCANRYLAMKDD 60

QY 43 PKLLYCSNGHFLRILPDGTVDRSDQHILQLSAESVGEVYIKSTGTGYLAMDTD 102

Db 61 GRMLALKWITDCEFFERLESNNYTYRSKYSD--WYVALKR 101

QY 103 GLLYGSQTNEECFLERLEENHNTYISKKHAENWFVGLKK 145

RESULT 4

ID Q07659 PRELIMINARY; PRT; 146 AA.

AC Q07659;

DT 01-NOV-1996 (TREMELrel. 01, Created)

DT 01-NOV-1996 (TREMELrel. 01, Last sequence update)

DT 01-NOV-1999 (TREMELrel. 12, Last annotation update)

DE FIBROBLAST GROWTH FACTOR.

GN BFGF.

OS Gallus gallus (Chicken).

OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;

OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.

RN [1]

RP SEQUENCE FROM N.A.

RX MEDLINE; 93246053.

RA BORJA A.Z., ZELLER R., MEIJERS C.;

RT "Expression of alternatively spliced bFGF first coding exons and

antisease mRNAs during chicken embryogenesis";

RL Dev. Biol. 157:110-118(1993).

RN [2]

RP SEQUENCE OF 52-85 FROM N.A.

RX MEDLINE; 90382254.

RA MITRANI E., GRUENBAUM Y., SHOHAT H., ZIV T.;

RT "Fibroblast growth factor during mesoderm induction in the early chick

embryo";

RL Development 109:387-393(1990).

DR EMBL; M95706; AAA48616.1; -

DR EMBL; X56804; CAA40139.1; -

DR HSSP; P09038; 2BFH.

DR PROSITE; PS00247; HBGF\_FGF; 1.

DR PFAM; PF00167; FGF; 1.

DR PRINTS; PR00262; ILIHBGF.

DR SEQUENCE 146 AA; 16182 MW; 44C5274B CRC32;

Query Match 27.9%; Score 346; DB 13; Length 146;  
 Best Local Similarity 48.1%; Pred. No. 3.35e-55;

Matches 50; Conservative 20; Mismatches 32; Indels 2; Gaps 1;

Db 45 ERVSAMVQLQQAERGVSIGVSNRELAMKEDGRLLALKCAEECEFFERLESNNYN 104

QY 68 DRSDQHILQLSAESVGEVYIKSTGTGYLAMDTGLLYGSQTNEECFLERLEENHYN 127

Db 105 TYRSKYSD--WYVALKRGTQYKGPQKPGOKAILFLPMSAKS 146

QY 128 TYISKHAENWFVGLKNGSKRGPRTHYGOKAILFLPLPVSS 171

RESULT 5

ID Q60487 PRELIMINARY; PRT; 115 AA.

AC Q60487;

DT 01-NOV-1996 (TREMELrel. 01, Created)

DT 01-NOV-1996 (TREMELrel. 01, Last sequence update)

DT 01-NOV-1999 (TREMELrel. 12, Last annotation update)

DE BASIC FIBROBLAST GROWTH FACTOR (FRAGMENT).

OS Cavia porcellus (Guinea pig).

OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;





QY 106 YGSGTPNECLFLERLEENHYNTYISK--KHAE--KNWFVGLKNGSKRGPRTHYGQKA 161  
Db 199 AHFLPRPL 206  
QY 162 ILFLPLFV 169  
||| |  
||| |  
RESULT 9 PRELIMINARY; PRT; 60 AA.  
ID Q16588;  
AC Q16588;  
DT 01-NOV-1996 (TREMBlrel. 01, Created)  
DT 01-NOV-1996 (TREMBlrel. 01, Last sequence update)  
DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)  
DE ACIDIC FIBROBLAST GROWTH FACTOR (FRAGMENT).  
OS Homo sapiens (Human).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
OC Eutheria; Primates; Catarrhini; Hominidae; Homo.  
RN [1]  
RP SEQUENCE FROM N.A.  
RX MEDLINE: 94069734.  
RA ZHAO X.M., YEHO T.K., HIEBERT M., FRIST W.H., MILLER G.G.;  
RT "The expression of acidic fibroblast growth factor (heparin-binding  
RT growth factor-1) and cytokine genes in human cardiac allografts and T  
RT cells.";  
RL Transplantation 56:1177-1182(1993).  
RN [2]  
RP SEQUENCE FROM N.A.  
RX MEDLINE: 92202857.  
RA LI Y.L., KHA H., GOLDEN J.A., MIGCHELSEN A.A.J., GOETZL E.J.,  
RA TURCK E.J.;  
RT "An acidic fibroblast growth factor protein generated by alternate  
RT splicing acts like an antagonist.";  
RL J. Exp. Med. 175:1073-1080(1992).  
DR EMBL: S67292; AAB29058.1; -  
DR EMBL: X65779; CAA46662.1; -  
DR HSSP: P05230; 2AXM.  
DR PFAM: PF00167; FGF; 1.  
FT NON\_TER 60  
SQ SEQUENCE 60 AA; 6697 MW; 6CC7DFF CRC32;  
Query Match 21.4%; Score 266; DB 4; Length 60;  
Best Local Similarity 89.7%; Pred. No. 1.89e-36;  
Matches 35; Conservative 3; Mismatches 1; Indels 0; Gaps 0;  
Db 20 PGNYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHTD 58  
QY 37 SANYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQ 75  
:|||||  
RESULT 10 PRELIMINARY; PRT; 59 AA.  
ID Q16089;  
AC Q16089;  
DT 01-NOV-1996 (TREMBlrel. 01, Created)  
DT 01-NOV-1996 (TREMBlrel. 01, Last sequence update)  
DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)  
DE ACIDIC FIBROBLAST GROWTH FACTOR (FRAGMENT).  
OS Homo sapiens (Human).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
OC Eutheria; Primates; Catarrhini; Hominidae; Homo.  
RN [1]  
RP SEQUENCE FROM N.A.  
RX MEDLINE: 94069734.  
RA ZHAO X.M., YEHO T.K., HIEBERT M., FRIST W.H., MILLER G.G.;  
RT "The expression of acidic fibroblast growth factor (heparin-binding  
RT growth factor-1) and cytokine genes in human cardiac allografts and T  
RT cells.";  
RL Transplantation 56:1177-1182(1993).  
DR EMBL: S67294; AAB29059.1; -  
DR HSSP: P05230; 2AXM.  
DR PFAM: PF00167; FGF; 1.  
FT NON\_TER 59  
SQ SEQUENCE 59 AA; 6595 MW; 1C932BID CRC32;

Query Match 21.3%; Score 265; DB 4; Length 59;  
Best Local Similarity 94.6%; Pred. No. 3.21e-36;  
Matches 35; Conservative 2; Mismatches 0; Indels 0; Gaps 0;  
Db 20 PGNYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQH 56  
QY 37 SANYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQH 73  
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RESULT 11 PRELIMINARY; PRT; 70 AA.  
ID O54837;  
AC O54837;  
DT 01-JUN-1998 (TREMBlrel. 06, Created)  
DT 01-JUN-1998 (TREMBlrel. 06, Last sequence update)  
DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)  
DE FIBROBLAST GROWTH FACTOR-1 (FRAGMENT).  
OS Mus musculus (Mouse).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
OC Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.  
RN [1]  
RP SEQUENCE FROM N.A.  
RX STRAIN=C3H/HEN; TISSUE=LIVER;  
RA ZHANG Y.-X., HACKSHAW K.V.;  
RL Submitted (JUL-1997) to the EMBL/GenBank/DBJ databases.  
DR EMBL: AF012926; AAB94020.1; -  
DR HSSP: P05230; 2AXM.  
DR PFAM: PF00167; FGF; 1.  
FT NON\_TER 70  
SQ SEQUENCE 70 AA; 7677 MW; 15A1BE5E CRC32;  
Query Match 21.3%; Score 264; DB 11; Length 70;  
Best Local Similarity 97.2%; Pred. No. 5.44e-36;  
Matches 35; Conservative 1; Mismatches 0; Indels 0; Gaps 0;  
Db 35 GNYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQH 70  
QY 38 ANYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQH 73  
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RESULT 12 PRELIMINARY; PRT; 196 AA.  
ID Q9YH31;  
AC Q9YH31;  
DT 01-MAY-1999 (TREMBlrel. 10, Created)  
DT 01-MAY-1999 (TREMBlrel. 10, Last sequence update)  
DT 01-NOV-1999 (TREMBlrel. 12, Last annotation update)  
DE PUTATIVE FIBROBLAST GROWTH FACTOR-4.  
OS Notophthalmus viridescens (Eastern newt) (Triturus viridescens).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Amphibia;  
OC Batrachia; Caudata; Salamandroidea; Salamandridae; Notophthalmus.  
RN [1]  
RP SEQUENCE FROM N.A.  
RA WEI Y.;  
RT "Putative Newt Fibroblast Growth Factor-4.";  
RL Submitted (OCT-1996) to the EMBL/GenBank/DBJ databases.  
DR EMBL: U76998; AAC98812.1; -  
DR HSSP: P09038; 1BFF.  
DR PROSITE: PS00247; HBG\_FGF; 1.  
SQ SEQUENCE 196 AA; 22033 MW; 455E08A3 CRC32;  
Query Match 20.9%; Score 260; DB 13; Length 196;  
Best Local Similarity 34.6%; Pred. No. 4.46e-35;  
Matches 44; Conservative 31; Mismatches 48; Indels 4; Gaps 3;  
Db 71 KRLRLRYCNVIGFHLQVLPDGRIGHMHSES-RYSLEISPVGVGVQSGFLAM 129  
QY 41 KRPKLLYCSNGGHF-LRLPDGTVGTRDRSDQH 99  
:|||||  
Db 130 NSKGRIFGSKYFSDCKFKEMLLPNNYNAYESWRYPCM--YIALSKNGRAKKNKVSPTM 187  
QY 100 DTDGLLYGSGTPNECLFLERLEENHYNTYISKHAEKNWFVGLKNGSKRGPRTHYGQ 159  
Db 188 TVTHFLP 194  
|||

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QY 46 LYCSNGGHFRIURIPDGTGTRDRSDQHQLQLSAESVGVEVIKSTETGOY.LAMDTDGLL 103
Db 61 YSSDVTPECKFKFESVFENYYVYVSTLRRQOESGRAWFLGLNKKEQIMKGNRVKTKPS 120
   : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY 106 YGSTOPNEECLFLERLEENHYNIYSK--KHAE--KNWFLGLKKNSCKRGRPRTHYGQKA 161
Db 121 SHFVPKP 127
   : : : : :
QY 162 ILFLPLP 168

RESULT 15
ID QYGD8      PRELIMINARY;      PRT: 206 AA.
AC QYGD8;
DT 01-MAY-1999 (TREMBLrel. 10, Created)
DT 01-MAY-1999 (TREMBLrel. 10, Last sequence update)
DT 01-NOV-1999 (TREMBLrel. 12, Last annotation update)
DE FTBROBLAST GROWTH FACTOR 6-RELATED PROTEIN.
FGF6.
GN Oncorhynchus mykiss (Rainbow trout) (Salmo gairdneri).
OS Oncorhynchus mykiss (Rainbow trout) (Salmo gairdneri).
OC Neopterygia; Metazoa; Chordata; Craniata; Vertebrata; Actinopterygii;
OC Eukaryota; Teleostei; Euteleostei; Protacanthopterygii;
OC Salmoniformes; Salmonidae; Oncorhynchus.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 99096461.
RA RESCAN P.Y.;
RT "Identification of a fibroblast growth factor 6 (FGF6) gene in a non-
RT mammalian vertebrate: continuous expression of FGF6 accompanies muscul-
RL fiber hyperplasia."
RL Blochim. Biophys. Acta 1443:305-314(1998).
DR ENBL; Y16850; CAA76422.1; -.
DR HSP; P09038; IBF.
DR PROSITE; PS00247; HBGF_FGF; 1.
SQ SEQUENCE 206 AA; 23375 MW; 818267C3 CRC32;

Query Match 20.1%; Score 250; DB 13; Length 206;
Best Local Similarity 31.5%; Pred. No. 8.38e-33;
Matches 40; Conservative 36; Mismatches 47; Indels 4; Gaps

Db 81 KRVRLLYCNAGIGFHLQVLPDGRINGVHN--ENQYSILIEISTVERGVSYLYGVRSFLVAM 139
   : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY 41 KKPFLYCSNGGHF-LRLIPDGVTDTRSDQHQLQLSAESVGVEVIKSTETGOY.LAM 99
   : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
Db 140 NSGRGLYGVTVFDECKFRESMLPNYNYAESVY--RGSYALNKHGRLKRGKKATTAM 197
   : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY 100 DTDGLLYGSOTPNEECFLERLEENHYNIYSKHAENWFLGLKKNSCKRGRPRTHYGQ 159
   : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
Db 198 TVTHFLP 204
   : : : : :
QY 160 KALFLP 166

Search completed: Tue Aug 29 16:08:54 2000
Job time : 65 secs.

```



SUMMARIES			
Result No.	Query Match	Score	Pred No.
1	64.7	984	5.88e-86
2	64.7	984	5.88e-86
3	64.7	984	5.88e-86
4	64.7	984	5.88e-86
5	64.7	984	5.88e-86
6	64.7	984	5.88e-86
7	64.7	984	5.88e-86
8	64.7	984	5.88e-86
9	64.7	984	5.88e-86
10	64.7	984	5.88e-86
11	64.7	984	5.88e-86
12	64.7	984	5.88e-86
13	64.7	984	5.88e-86
14	64.7	984	5.88e-86
15	64.7	984	5.88e-86
16	64.7	984	5.88e-86
17	64.7	984	5.88e-86
18	64.7	984	5.88e-86
19	64.7	984	5.88e-86
20	64.7	984	5.88e-86
21	64.7	984	5.88e-86
22	64.7	984	5.88e-86
23	64.7	984	5.88e-86
24	64.7	984	5.88e-86

QY 196 GOKAILFLPLPVSSD 210

# RESULT 2

ID R34497 standard; protein; 140 AA.  
AC R34497;  
DT 06-AUG-1993 (first entry)  
DE Human acidic fibroblast Growth Factor.  
KW aFGF; mutain; glycosylation site; glycoprotein.  
OS Homo sapiens.  
PN J05076356-A.  
PD 30-MAY-1991; 127435.  
PF 30-MAY-1991; JP-143388.  
PR 31-MAY-1990; JP-143388.  
PA (TAKE ) TAKEDA CHEM IND LTD.  
DR WPI; 93-139564/17.  
PT FGF mutin prepn. useful for therapy of burn or thrombosis - by transformation of lymphocyte-contained animal cell by vector contg. DNA encoding FGF mutin  
TS Disclosure: Page 3; 23pp; Japanese.  
CC The invention covers mutins of FGF (esp. bFGF) which contain at least one glycosylation site. The mutins can be used to treat burns and thrombosis.  
SQ Sequence 140 AA;

Query Match 64.7%; Score 984; DB 1; Length 140;  
Best Local Similarity 99.3%; Pred. No. 5.88e-86;  
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 65  
:|||||

QY 76 ANYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 135

Db 66 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 125  
:|||||

QY 136 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 195

Db 126 GOKAILFLPLPVSSD 140

QY 196 GOKAILFLPLPVSSD 210

# RESULT 3

ID P90068 standard; protein; 140 AA.  
AC P90068;  
DT 1-NOV-1989 (first entry)  
DE Human acid fibroblast growth factor  
KW Human acidic fibroblast growth factor; mutant.  
OS Homo sapiens  
PN EP-319052-A.  
PD 14-JUN-1989.  
PF 14-OCT-1988; 202306.  
PR 22-OCT-1987; EP-244431.  
PA (MERI) Merck and Co.  
PI Thomas Jnr KA, Linemeyer DL;  
DR WPI; 89-167092/23.  
PT Mutant acidic fibroblast growth factor  
TS - used for promoting repair of soft tissue, musculoskeletal tissue or vascular or nerve tissue and plasminogen activator prodn.  
CC Amino acid sequence of human acidic fibroblast growth factor (aFGF). The patent claims mutant forms which have increased biological activity with(out) heparin, and promote cell growth.  
SQ Sequence 140 AA;

Query Match 64.7%; Score 984; DB 1; Length 140;  
Best Local Similarity 99.3%; Pred. No. 5.88e-86;  
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 65  
:|||||

QY 76 ANYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 135

Db 66 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 125  
:|||||

QY 136 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 195

Db 126 GOKAILFLPLPVSSD 140

QY 196 GOKAILFLPLPVSSD 210

# RESULT 4

ID R74647 standard; protein; 140 AA.  
AC R74647;  
DT 25-SEP-1995 (first entry)  
DE Human recombinant aFGF.  
KW Acidic fibroblast growth factor; aFGF; vulnery; angiogenesis; mitogen.  
OS Homo sapiens.  
PN US5401832-A.  
PD 28-MAR-1995.  
PF 24-DEC-1984; US-685923.  
PR 24-DEC-1984; US-685923.  
PR 12-SEP-1985; US-774359.  
PR 30-MAY-1986; US-868473.  
PR 11-JUL-1986; US-884460.  
PR 04-JUN-1987; US-054991.  
PR 04-MAY-1988; US-190293.  
PR 08-FEB-1991; US-654397.  
PR 25-SEP-1991; US-765472.  
PR 25-SEP-1992; US-951365.  
PA (MERI) MERCK & CO INC.  
PI Gimenez-Gallego G, Kelly LJ, Linemeyer DL, Thomas KA;  
DR WPI; 95-138983/18.  
PT New recombinant human acidic fibroblast growth factor - used to promote cell growth, to promote wound healing, for vascular grafts and blood vessel repair  
TS Claim 2; Column 30; 25pp; English.  
CC Oligonucleotides were synthesized on the basis of the amino acid sequence of bovine acidic fibroblast growth factor (aFGF) and used to produce a synthetic gene (given in Q88233) incorporating CC codons preferred by E. coli or mammalian cells, unique cloning sites, etc. This synthetic gene was mutagenized to obtain a gene CC encoding a human recombinant aFGF (R74647) having activity CC equivalent to the native protein.  
SQ Sequence 140 AA;

Query Match 64.7%; Score 984; DB 1; Length 140;  
Best Local Similarity 99.3%; Pred. No. 5.88e-86;  
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 65  
:|||||

QY 76 ANYKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEYIKSTETGQYL 135

Db 66 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 125  
:|||||

QY 136 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 195

Db 126 GOKAILFLPLPVSSD 140

QY 196 GOKAILFLPLPVSSD 210

# RESULT 5

ID W04806 standard; Protein; 140 AA.  
AC W04806;  
DT 29-DEC-1996 (first entry)  
DE Human acidic fibroblast growth factor.  
KW Endothelial cell growth factor; ECGF; blood vessel; regeneration; Heparin-Sepharose affinity chromatography; probe; oligonucleotide; FGF; fibroblast growth factor; ss.  
OS Homo sapiens.

PN US552528-A.  
 PD 03-SEP-1996.  
 PF 03-MAR-1986; 835594.  
 PR 03-MAR-1986; US-835594.  
 PR 18-DEC-1987; US-134499.  
 PR 29-APR-1991; US-693079.  
 PR 27-NOV-1991; US-799859.  
 PR 03-NOV-1994; US-334884.  
 PA (RHON ) RHONE POULENC RORER PHARM INC.  
 PI Burgess W, Maciag T;  
 DR WPI: 96-412132/41.  
 DR N-PSDB; T37503.  
 DR Isolated, purified, biologically active bovine beta endothelial cell  
 PT growth factor - useful to regenerate or treat damaged blood vessels  
 PS Disclosure; Fig 8; 28pp; English.  
 CC Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having  
 CC a mol. wt. of 20 kD can be purified at least 16300 fold from bovine  
 CC brain using heparin-Sepharose affinity chromatography. ECGF is  
 CC useful for, among other purposes, diagnostic applications and has  
 CC potential in the treatment of damaged blood vessels or other  
 CC endothelial cell-lined structures.  
 CC Human ECGF (T37503) or fragments may be obtained using  
 CC oligonucleotides (T37504 and T37508 to T37509) whose design is based  
 CC on the sequence of bovine alpha- and beta-ECGF.  
 SQ Sequence 140 AA;

Query Match 64.7%; Score 984; DB 1; Length 140;  
 Best Local Similarity 99.3%; Pred. No. 5.88e-86;  
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 65  
 QY :|||||  
 76 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 135  
 :|||||

Db 66 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENWVGLKKNKSGCRGRPTHY 125  
 QY :|||||  
 136 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENWVGLKKNKSGCRGRPTHY 195  
 :|||||

Db 126 GOKAILFLPLPVSSD 140  
 QY :|||||  
 196 GOKAILFLPLPVSSD 210  
 :|||||

RESULT 6  
 ID P70995 standard; protein; 140 AA.  
 AC P70995;  
 DT 13-JUN-1991 (first entry)  
 DE Sequence of human proteinaceous factor (PFI) with mitogenic activity.  
 KW Cell growth promoter; mitogen; vascularisation; wound healing.  
 OS Homo sapiens.  
 FH Key Location/Qualifiers  
 FT misc\_difference 140 /label= Asp-OH  
 FT EP-241136-A.  
 PN 14-OCT-1987.  
 PD 06-MAR-1987; 301969.  
 PR 07-MAR-1986; US-838096.  
 PA (HARD ) HARVARD COLLEGE.  
 PI Lobb RR, Harper JW, Strydom DJ;  
 DR WPI: 87-285995/41.  
 DR Mitogenic polypeptide isolated from human brain tissue - useful  
 PT for increasing vascular effect in eg wound healing, or  
 PT generating endothelial cell linings for vascular prostheses, etc.  
 PS Claim 3; Page 1; 31pp; English.  
 CC The PF of the invention was obtd. from human brain tissue. It has a  
 CC mol. wt. of 15,200-16,500 (pref. 15,616-16,056) and has a high  
 CC affinity for heparin. PFI and fragments are useful for promoting the  
 CC growth of mesoderm-derived cells or neuroectoderm-derived cells and  
 CC generating endothelial cell linings for vascular prostheses (all  
 CC claimed). The polypeptides are useful for increasing vascularisation.  
 SQ Sequence 140 AA;

Query Match

64.7%; Score 984; DB 1; Length 140;

Best Local Similarity 99.3%; Pred. No. 5.88e-86;  
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 6 GNYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 65  
 QY :|||||  
 76 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 135  
 :|||||

Db 66 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENWVGLKKNKSGCRGRPTHY 125  
 QY :|||||  
 136 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENWVGLKKNKSGCRGRPTHY 195  
 :|||||

Db 126 GOKAILFLPLPVSSD 140  
 QY :|||||  
 196 GOKAILFLPLPVSSD 210  
 :|||||

RESULT 7  
 ID R10527 standard; Protein; 141 AA.  
 AC R10527;  
 DT 15-APR-1991 (first entry)  
 DE Human acidic fibroblast growth factor gene.  
 KW aFGF; antibody; antigen; cancer; ss.  
 OS Homo sapiens.  
 FH Key Location/Qualifiers  
 FT region 2..12  
 FT /label= A  
 FT region 56..67  
 FT /label= B  
 FT region 104..114  
 FT /label= C  
 FT region 132..141  
 FT /label= D  
 PN J02306996-A.  
 PD 20-DEC-1990.  
 PF 03-JUL-1989; 172542.  
 PR 04-JUL-1988; JP-166275.  
 PR 03-JUL-1989; JP-172542.  
 PA (TAKE ) TAKEDA CHEMICAL IND KK.  
 DR WPI: 91-040150/06.  
 DR N-PSDB; Q10399;  
 DR Anti-acid antibody, for cancer diagnosis, etc. - is obtd. by  
 PT using complex of partial peptide(s) of acid fibroblast growth  
 PT factor and protein as antigen.  
 PS Disclosure; Fig 1; 19pp; Japanese.  
 CC The was deduced from a gene used to produce recombinant aFGF.  
 CC Peptides derived from the protein, esp. from A-D can be used to as  
 CC antigens to produce anti-aFGF antibodies. The peptides must  
 CC comprise 8-10 continuous AAs from A or B (Claims 5 and 6 resp.),  
 CC 7-10 continuous AAs from C (claim 7), or 8-9 continuous AAs from D  
 CC (claim 8). The Abs can be used for immunochemically measuring aFGF,  
 CC and for purifying aFGF. They are useful as reagents in the diag-  
 CC nosis of various cancers or diseases of the CNS. Purified aFGF  
 CC has wound healing and nerve cell proliferating properties.  
 SQ Sequence 141 AA;

Query Match 64.7%; Score 984; DB 1; Length 141;  
 Best Local Similarity 99.3%; Pred. No. 5.88e-86;  
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 7 GNYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 66  
 QY :|||||  
 76 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVYIKSTETGQYL 135  
 :|||||

Db 67 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENWVGLKKNKSGCRGRPTHY 126  
 QY :|||||  
 136 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKKAENWVGLKKNKSGCRGRPTHY 195  
 :|||||

Db 127 GOKAILFLPLPVSSD 141  
 QY :|||||  
 196 GOKAILFLPLPVSSD 210  
 :|||||

RESULT 8

PI Burgess W, Drohan WN, Jaye M, Maciag T;  
DR WPI: 99-069734/06.  
PT DNA encoding a cleavable signal peptide and an endothelial cell  
PT growth factor - useful for producing recombinant endothelial cell  
PT growth factor proteins  
PS Claim 1; Column 16; 23pp; English.  
CC This represents the amino acid sequence of human beta-endothelial cell  
CC growth factor (ECGF). The invention is directed to DNA encoding alpha-  
CC or beta-ECGF and plasmids comprising the DNA sequences. The DNA encodes a  
CC cleavable signal peptide and an ECGF, where removal of the signal peptide  
CC yields a mature form of the ECGF. The DNA is used to produce recombinant  
CC ECGF proteins, which can be used in treatments to repair or regenerate  
CC blood vessels or other structures lined with endothelial cells.  
SQ Sequence 154 AA;

Query Match 64.7%; Score 984; DB 1; Length 154;  
Best Local Similarity 99.3%; Pred. No. 5.88e-86;  
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 20 GNTKPKLLYCSNGGHFLRPDGVNDCRTDRSDQHIOQLSAESGVGIKSTETGOYL 79  
PT :|||||  
Qy 76 ANTKPKLLYCSNGGHFLRPDGVNDCRTDRSDQHIOQLSAESGVGIKSTETGOYL 135  
PT :|||||  
Db 80 AMDTDGLLYGSGTNPNECLFLERLEENHYNTYISKKAERNFVGLKNGSKCRGRPTHY 139  
PT :|||||  
Qy 136 AMDTDGLLYGSGTNPNECLFLERLEENHYNTYISKKAERNFVGLKNGSKCRGRPTHY 195  
PT :|||||  
Db 140 GQRAILFLPLVSSD 154  
PT :|||||  
Qy 196 GQRAILFLPLVSSD 210  
PT :|||||

RESULT 10

ID W04805 standard; Protein; 154 AA.  
AC W04805;  
DT 29-DEC-1996 (first entry)  
DE Human beta-endothelial cell growth factor.  
KW Endothelial cell growth factor; ECGF; blood vessel; regeneration;  
KW heparin-sepharose affinity chromatography; probe; oligonucleotide;  
KW EGF; fibroblast growth factor.  
OS Homo sapiens.  
PN US552528-A.  
PD 03-SEP-1996.  
PF 03-MAR-1986; 835594.  
PR 03-MAR-1986; US-835594.  
PR 18-DEC-1987; US-134499.  
PR 23-APR-1991; US-693079.  
PR 27-NOV-1991; US-799859.  
PR 03-NOV-1994; US-334884.  
PA (RHON ) RHONE POULENC RORER PHARM INC.  
PI Burgess W, Maciag T;  
DR WPI: 96-412132/41.  
DR N-PSDB; T37503.  
PT Isolated, purified, biologically active bovine beta endothelial cell  
PT growth factor. - useful to regenerate or treat damaged blood vessels  
PT Disclosure; Fig 8; 28pp; English.  
PS Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having  
CC a mol. wt. of 20 kD can be purified at least 16300 fold from bovine  
CC brain using heparin-sepharose affinity chromatography. ECGF is  
CC useful for, among other purposes, diagnostic applications and has  
CC potential in the treatment of damaged blood vessels or other  
CC endothelial cell-lined structures.  
CC Human ECGF (T37503) or fragments may be obtained using  
CC oligonucleotides (T37504 and T37508 to T37509) whose design is based  
CC on the sequence of bovine alpha- and beta-ECGF.  
SQ Sequence 154 AA;

Query Match 64.7%; Score 984; DB 1; Length 154;  
Best Local Similarity 99.3%; Pred. No. 5.88e-86;  
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 20 GNTKPKLLYCSNGGHFLRPDGVNDCRTDRSDQHIOQLSAESGVGIKSTETGOYL 79  
PT :|||||



QY 76 ANYKKPKLLYCSNGGHEFLRLIPDGTGTRSDQHIQQLSAESVGEVYIKSTETGOYL 135  
Db 80 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPRTHY 139  
QY 136 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPRTHY 195  
Db 140 GOKAILFLPLPVSSD 154  
QY 196 GOKAILFLPLPVSSD 210

## RESULT 11

ID W06816 standard; protein; 154 AA.  
AC W06816;  
DT 17-MAR-1997 (first entry)  
DE Human endothelial cell growth factor-beta.  
KW Endothelial cell growth factor-beta; ECGF-beta.  
OS Homo sapiens.  
PN US5571790-A.  
DB 05-NOV-1996.  
QY 03-MAR-1986; 835594.  
Db 03-MAR-1986; US-835594.  
QY 18-DEC-1987; US-134499.  
Db 29-APR-1991; US-693079.  
QY 27-NOV-1991; US-799859.  
Db 03-NOV-1994; US-334884.  
QY 07-JUN-1995; US-472964.  
Db (RHON ) RHONE-POULENC RORER PHARM INC.  
PI Burgess W, Drohan WN, Jaye M, Maciag T;  
DR WPI; 96-505421/50.  
QY N-PSDB; T45983.  
Db Recombinant human endothelial cell growth factors - for treating  
PT damaged blood vessels, etc.  
PS Claim 1; Column 16; 22pp; English.  
CC Human recombinant endothelial cell growth factors (ECGF) beta  
CC (W06816) and alpha (W06817) differ only at their N-terminal ends.  
CC They can be produced in transformed prokaryotic or eukaryotic host  
CC cells using DNA sequences (T45983 and T45984, respectively) derived  
CC from the complete human ECGF cDNA (T45985). Large quantities of  
CC the ECGFs are produced by culturing the host cells and recovering  
CC the proteins. ECGFs have utility in the growth and amplification  
CC of endothelial cells in culture. They can potentially be used to  
CC treat damaged blood vessels and other endothelial cell-lined  
CC structures, and also have diagnostic applns.  
SQ Sequence 154 AA;

## Query Match 64.7%; Score 984; DB 1; Length 154;

Best Local Similarity 99.3%; Pred. No. 5.88e-86;  
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

QY 20 GNYKKPKLLYCSNGGHEFLRLIPDGTGTRSDQHIQQLSAESVGEVYIKSTETGOYL 79  
Db 76 ANYKKPKLLYCSNGGHEFLRLIPDGTGTRSDQHIQQLSAESVGEVYIKSTETGOYL 135  
QY 80 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPRTHY 139  
QY 136 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPRTHY 195  
Db 140 GOKAILFLPLPVSSD 154  
QY 196 GOKAILFLPLPVSSD 210

## RESULT 12

ID W75414 standard; protein; 154 AA.  
AC W75414;  
DT 02-MAR-1999 (first entry)  
DE Human beta-endothelial cell growth factor.  
KW Human; endothelial cell growth factor; ECGF; brain stem; probe;  
KW hybridisation; bovine; wound healing; prosthetic device.  
OS Homo sapiens.  
PN US5827826-A.  
PD 27-OCT-1998.

PF 04-NOV-1996; 743261.  
PR 04-NOV-1996; US-743261.  
PR 03-MAR-1986; US-835594.  
PR 18-DEC-1987; US-134499.  
PR 29-APR-1991; US-693079.  
PR 27-NOV-1991; US-799859.  
PR 03-NOV-1994; US-334884.  
PR 07-JUN-1995; US-472964.  
PA (RHON ) RHONE-POULENC RORER PHARM INC.  
PI Burgess W, Drohan WN, Jaye M, Maciag T;  
DR WPI; 98-594032/50.  
PT Compositions for promoting wound healing - containing endothelial  
PT cell growth factor polypeptides  
PS Claim 1; Column 16; 23pp; English.  
CC This sequence represents the amino acid sequence of the mature human  
CC beta-endothelial cell growth factor (b-ECGF). This amino acid sequence  
CC is identical to the alpha-ECGF but the beta sequence contains an extra  
CC 20 N-terminal amino acids. The sequence was isolated from a human brain  
CC stem cell cDNA library using a probe designed based on fragments of the  
CC bovine ECGF (see W75416-W75418). The ECGF protein can be used in  
CC compositions for promoting wound healing. ECGF is also used to grow  
CC cells on a prosthetic device.  
SQ Sequence 154 AA;

## Query Match 64.7%; Score 984; DB 1; Length 154;

Best Local Similarity 99.3%; Pred. No. 5.88e-86;  
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 20 GNYKKPKLLYCSNGGHEFLRLIPDGTGTRSDQHIQQLSAESVGEVYIKSTETGOYL 79  
QY 76 ANYKKPKLLYCSNGGHEFLRLIPDGTGTRSDQHIQQLSAESVGEVYIKSTETGOYL 135  
Db 80 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPRTHY 139  
QY 136 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPRTHY 195  
Db 140 GOKAILFLPLPVSSD 154  
QY 196 GOKAILFLPLPVSSD 210

## RESULT 13

ID P94037 standard; protein; 155 AA.  
AC P94037;  
DT 25-JUN-1990 (first entry)  
DE Human acidic fibroblast growth factor.  
KW Acidic fibroblast growth factor.  
OS Homo sapiens.  
PN EP-298723-A.  
PD 11-JAN-1989.  
PF 06-JUL-1988; 306158.  
PR 07-JUL-1987; US-070797.  
PA (BIOT-) Biotechn Res Assoc.  
PI Fiddes JC, Abraham JA, Protter A;  
DR WPI; 89-009785/02.  
DR N-PSDB; N93088.  
PT Recombinant DNA encoding new fibroblast growth factor  
PT analogues - useful eg for accelerating wound healing and  
PT to control neovascularisation.  
PS Disclosure; p; English.  
CC See also P94038.  
SQ Sequence 155 AA;

## Query Match 64.7%; Score 984; DB 1; Length 155;

Best Local Similarity 99.3%; Pred. No. 5.88e-86;  
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHEFLRLIPDGTGTRSDQHIQQLSAESVGEVYIKSTETGOYL 80  
QY 76 ANYKKPKLLYCSNGGHEFLRLIPDGTGTRSDQHIQQLSAESVGEVYIKSTETGOYL 135  
Db 81 AMDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPRTHY 140

QY 136 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 195  
Db 141 GOKAILFLPLPVSSD 155  
QY 196 GOKAILFLPLPVSSD 210

## RESULT 14

ID R70812 standard; protein; 155 AA.  
AC R70812; 1995 (first entry)  
DE FGF-1.  
KW FGF-1; fibroblast growth factor; cytotoxic conjugate; fusion protein;  
KW saporin; cytostatic; tumor; diabetes; rheumatoid arthritis.  
OS Homo sapiens.  
FH Key Location/Qualifiers  
FT misc\_difference 31 /note= "Cys may be replaced by Ser"  
FT misc\_difference 132 /note= "Cys may be replaced by Ser"

W09503831-A.  
09-FEB-1995.  
PF 27-JUL-1994; U08511.  
PR 02-AUG-1993; US-099924.  
PR 29-OCT-1993; US-145829.  
PA (PRIZ-) PRIZM PHARM INC.  
PA (WHIT-) WHITTIER INST DIABETES & ENDOCRINOLOGY.  
PI Baird AJ, Lappi DA, Sosnowski BA;  
DR WPI; 95-082038/11.  
PT New monogenous preparations of cytotoxic conjugates and DNA  
PT contain fibroblast growth factors and cytotoxic agents for  
PT treating FGF conditions such as tumours, diabetes and rheumatoid  
PT arthritis.  
PS Disclosure; Page 108-109; 128pp; English.  
CC Novel fusion proteins comprise FGF linked to saporin. FGF-1 to -9  
CC may be used, pref. FGF-1 (R70812), FGF-5 (R70814) or  
CC FGF-8 (R70815) muteins, in which at least 1 Cys residue is replaced  
CC by conservative Ser substitutions. The fusion proteins are potent  
CC cytotoxic agents to cells bearing the FGF receptor.  
SQ Sequence 155 AA;

Query Match 64.7%; Score 984; DB 1; Length 155;  
Best Local Similarity 99.3%; Pred. No. 5.88e-86;  
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRILPDGTGTRDRSDQHIQLLSAESVGEVYIKSTETGOYL 80  
76 ANYKKPKLLYCSNGGHFLRILPDGTGTRDRSDQHIQLLSAESVGEVYIKSTETGOYL 135  
QY 81 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 140  
136 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 195  
Db 141 GOKAILFLPLPVSSD 155  
QY 196 GOKAILFLPLPVSSD 210

## RESULT 15

ID P70482 standard; protein; 155 AA.  
AC P70482;  
DT 13-MAY-1991 (first entry)  
DE Sequence encoded by complete cDNA sequence of human endothelial  
DE cell growth factor (ECGF).  
KW Endothelial cell regeneration; blood vessel regeneration.  
OS Homo sapiens.  
FH Key Location/Qualifiers  
FT protein 2..15  
FT protein /label= Beta ECGF  
FT protein 16..21  
FT protein /label= Acidic FGF  
FT protein 22..155  
FT protein /label= Alpha ECGF

PN W08705332-A.  
PD 11-SEP-1987.  
PF 02-MAR-1987; U00425.  
PR 03-MAR-1986; US-835594.  
PR 26-MAR-1987; ES-000812.  
PA (MELO-) MELOY LAB INC.  
PA (RORE-) RORER BIOTECHN INC.  
PA (RORE-) RORER.  
PA BIOTECH INC.  
PI Jaye M, Burgess W, Maciag T, Drohan W;  
DR WPI; 87-264128/37.  
DR N-PSDB; N70788  
PT Human endothelial cell growth factor - produced by recombinant  
PT DNA techniques, useful for wound healing  
PS Example; Fig 8; 43pp; English.  
CC To screen the human brain stem cDNA library for clones contg. ECGF  
CC inserts, a specific oligonucleotide was designed. This  
CC oligonucleotide was based upon a partial AA sequence analysis of  
CC the amino terminus of ECGF (see P70480 and P70481). Fig 3c sets  
CC forth for comparison the AA sequence of cyanogen bromide-cleaved  
CC bovine alpha and beta ECGF (P70834). The two clones that were  
CC isolated, ECGF clones 1 and 29, were analysed in further detail. The  
CC nucleotide sequence of these clones and the AA sequence deduced from  
CC the nucleic acid sequence is shown in Fig 8 (see N70788 and P70482).  
SQ Sequence 155 AA;

Query Match 64.7%; Score 984; DB 1; Length 155;  
Best Local Similarity 99.3%; Pred. No. 5.88e-86;  
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRILPDGTGTRDRSDQHIQLLSAESVGEVYIKSTETGOYL 80  
QY 76 ANYKKPKLLYCSNGGHFLRILPDGTGTRDRSDQHIQLLSAESVGEVYIKSTETGOYL 135  
Db 81 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 140  
QY 136 AMDTGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSCKRGPRTHY 195  
Db 141 GOKAILFLPLPVSSD 155  
QY 196 GOKAILFLPLPVSSD 210

Search completed: Tue Aug 29 16:13:57 2000  
Job time : 26 secs.

\*\*\*\*\*  
[MPSRCH\_PP] (TM)  
\*\*\*\*\*

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MPSrch\_PP protein - protein database search, using Smith-Waterman algorithm  
Run on: Tue Aug 29 16:12:04 2000; MasPar time 12.61 Seconds  
Abular output not generated. 785.806 Million cell updates/sec

Title: >US-09-121-017B-27  
Description: (1-210)-from-0909121017B.pep  
Perfect Score: 1522  
Sequence: 1 MSKGRVQGTQLQALVFLGV.....PRHYGQKAILFLPLPVSSD 210

Scoring table: PAM 150  
Gap 11

Searched: 142080 seqs, 47172406 residues

Post-processing: Minimum Match 0%  
Listing first 45 summaries

Database: pir64  
1:pir1 2:pir2 3:pir3 4:pir4

Statistics: Mean 44.620; Variance 79.868; scale 0.559

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES				Pred. No.	
Result No.	Score	Query Match	Description	ID	Pred. No.
1	984	64.7	acidic fibroblast gro	A33665	2.00e-192
2	967	63.5	acidic fibroblast gro	A60721	1.76e-188
3	966	63.5	acidic fibroblast gro	D37360	3.00e-188
4	966	63.5	acidic fibroblast gro	S04147	3.00e-188
5	953	62.6	acidic fibroblast gro	JH0476	3.09e-185
6	917	60.2	acidic fibroblast gro	GRBOA	6.69e-177
7	916	60.2	acidic fibroblast gro	A60130	1.14e-176
8	906	59.5	fibroblast growth fac	JW0055	2.34e-174
9	702	46.1	fibroblast growth fac	S14192	1.66e-127
10	681	44.7	fibroblast growth fac	S20102	1.00e-122
11	522	34.3	basic fibroblast grow	A48834	6.67e-87
12	516	33.9	basic fibroblast grow	S00185	1.45e-85
13	516	33.9	basic fibroblast grow	GRBOB	1.45e-85
14	508	33.4	basic fibroblast grow	D37360	8.70e-84
15	508	33.4	basic fibroblast grow	A31674	8.70e-84
16	509	33.4	basic fibroblast grow	A32398	5.21e-84
17	498	32.7	basic fibroblast grow	S31622	1.44e-81
18	489	32.1	basic fibroblast grow	A40117	1.43e-79
19	466	30.6	fibroblast growth fac	I46711	1.72e-74
20	376	24.7	embryonic fibroblast	S54407	7.13e-55
21	350	23.0	fibroblast growth fac	S66486	2.64e-49
22	350	23.0	fibroblast growth fac	A48137	2.64e-49
23	341	22.4	embryonic fibroblast	S23595	2.17e-47

24	329	21.6	207	2	JC5941	fibroblast growth fac	7.53e-45
25	324	21.3	207	2	JC5940	fibroblast growth fac	8.55e-44
26	310	20.4	194	2	I50710	fibroblast growth fac	7.46e-41
27	304	20.0	206	2	JC4268	HST protein - bovine	1.34e-39
28	302	19.8	194	2	S49501	keratinocyte growth f	3.50e-39
29	299	19.6	194	1	A36301	fibroblast growth fac	1.47e-38
30	295	19.4	194	2	I48610	keratinocyte growth f	1.00e-37
31	293	19.3	194	2	S26049	fibroblast growth fac	2.60e-37
32	279	18.3	264	2	A36207	transforming protein	2.03e-34
33	277	18.2	266	2	S68144	fibroblast growth fac	5.22e-34
34	272	17.9	206	1	TVH0HS	fibroblast growth fac	5.54e-33
35	269	17.7	267	1	TVHUF5	transforming protein	2.27e-32
36	266	17.5	256	2	JC4627	fibroblast growth fac	9.31e-32
37	265	17.4	60	2	JH0708	fibroblast growth fac	1.49e-31
38	257	16.9	168	2	JG0184	fibroblast growth fac	6.28e-30
39	256	16.8	202	1	TVMSHS	transforming protein	1.00e-29
40	256	16.4	220	2	I50588	FeF-3 - chicken	1.63e-28
41	236	15.5	125	2	A32484	basic fibroblast grow	1.03e-25
42	236	15.5	237	1	S39582	transforming protein	1.03e-25
43	234	15.4	97	2	B46289	keratinocyte growth f	2.58e-25
44	233	15.3	245	1	TVMS72	transforming protein	4.08e-25
45	229	15.0	239	1	S04742	fibroblast growth fac	2.53e-24

ALIGNMENTS

RESULT	1
ENTRY	A33665 #type complete
TITLE	acidic fibroblast growth factor 1 precursor - human
ALTERNATE_NAMES	beta-ECGF; endothelial cell growth factor beta; heparin-binding growth factor 1
ORGANISM	#formal_name Homo sapiens #common_name man
DATE	10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 10-Sep-1999
ACCESSIONS	A33665; A32316; S18217; A43804; A24662; JH0707; S35535; S35536; I39413; A23553; A24820; A24243; A24301; A26386; A53639
REFERENCE	A33665
#authors	Mergia, A.; Tischer, E.; Graves, D.; Tumolo, A.; Miller, J.; Gospodarowicz, D.; Abraham, J.A.; Shipley, G.D.; Fiddes, J.C.
#journal	Biochem. Biophys. Res. Commun. (1989) 164:1121-1129
#title	Structural analysis of the gene for human acidic fibroblast growth factor
#cross-references	MUID:90073637
#accession	A33665
#molecule_type	DNA
#residues	1-155 #label MER
#cross-references	GB:M30491
REFERENCE	A32316
#authors	Wang, W.P.; Lehtoma, K.; Varban, M.L.; Krishnan, I.; Chiu, I.M.
#journal	Mol. Cell. Biol. (1989) 9:2387-2395
#title	Cloning of the gene coding for human class 1 heparin-binding growth factor and its expression in fetal tissues.
#cross-references	MUID:89343957
#accession	A32316
#molecule_type	DNA
#residues	1-155 #label WAN
#cross-references	GB:M23087; NID:g183875; PIDN:AAA52638.1; PID:g386768
REFERENCE	S18217
#authors	Wang, W.P.; Quick, D.; Balcerzak, S.P.; Needelman, S.W.; Chiu, I.M.
#journal	Oncogene (1991) 6:1521-1529
#title	Cloning and sequence analysis of the human acidic fibroblast growth factor gene and its preservation in leukemia patients.
#cross-references	MUID:92019819
#accession	Sit217
#molecule_type	DNA
#residues	1-155 #label WA2
#cross-references	EMBL:M23086
REFERENCE	A43804

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#authors      Chiu, I.M.; Wang, W.P.; Lehtoma, K.
#journal      Oncogene (1990) 5:755-762
#title       Alternative splicing, generates two forms of mRNA coding for
              human heparin-binding growth factor 1.
#cross-references MUID:90265618
#accession    A43804
#molecule_type mRNA
#residues     1-155 #label CHI
#cross-references EMBL:X51943; NID:g32435; PIDN:CAA36206.1; PID:g32436
REFERENCE
#authors      Jaye, M.; Howk, R.; Burgess, W.; Ricca, G.A.; Chiu, I.M.;
              Ravera, M.V.; O'Brien, S.J.; Modi, W.S.; Maciag, T.;
              Drohan, W.N.
#journal      Science (1986) 233:541-545
#title       Human endothelial cell growth factor: cloning, nucleotide
              sequence, and chromosome localization.
#cross-references MUID:86261805
#accession    A24662
#molecule_type mRNA
#residues     1-155 #label JAY
#cross-references GB:M13361; NID:g181941; PIDN:AAA79245.1; PID:g181942
REFERENCE
#authors      Yu, Y.L.; Kha, H.; Golden, J.A.; Migchielsen, A.A.J.; Goetzl,
              E.J.; Turck, C.W.
#journal      J. Exp. Med. (1992) 175:1073-1080
#title       An acidic fibroblast growth factor protein generated by
              alternate splicing acts like an antagonist.
#cross-references MUID:92202857
#accession    JH0707
#molecule_type mRNA
#residues     1-155 #label YUY
#cross-references GB:X65778; NID:g396163; PIDN:CAA46661.1; PID:g396164
REFERENCE
#authors      Payson, R.A.; Canatan, H.; Chotani, M.A.; Wang, W.P.; Harris,
              S.E.; Myers, R.L.; Chiu, I.M.
#journal      Nucleic Acids Res. (1993) 21:489-495
#title       Cloning of two novel forms of human acidic fibroblast growth
              factor (arGF) mRNA.
#cross-references MUID:93181239
#accession    S35535
#status       translation not shown
#molecule_type mRNA
#residues     1-58 #label PAY
#cross-references GB:L01485
#accession    S35536
#status       translation not shown
#molecule_type mRNA
#residues     1-58 #label PA2
#cross-references GB:L01487
REFERENCE
#authors      Crumley, G.; Dionne, C.A.; Jaye, M.
#journal      Biochem. Biophys. Res. Commun. (1990) 171:7-13
#title       The gene for human acidic fibroblast growth factor encodes
              two upstream exons alternatively spliced to the first
              coding exon.
#cross-references MUID:90365758
#accession    I39413
#status       translation not shown
#molecule_type mRNA
#residues     1-40 #label RES
#cross-references GB:M60515; NID:g178226; PIDN:AAA51672.1; PID:g553170;
              GB:M60516; NID:g178232; PID:g553171
REFERENCE
#authors      Harper, J.W.; Strydom, D.J.; Lobb, R.R.
#journal      Biochemistry (1986) 25:4097-4103
#cross-references MUID:86296647
#accession    A23553
#molecule_type protein
#residues     16-155 #label HAR
REFERENCE
#authors      Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal      Biochem. Biophys. Res. Commun. (1986) 138:611-617
#title       The complete amino acid sequence of human brain-derived
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```
acidic fibroblast growth factor.
#cross-references MUID:86295741
#accession    A24820
#molecule_type protein
#residues     16-155 #label GIM
REFERENCE
#authors      Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal      Biochem. Biophys. Res. Commun. (1986) 135:541-548
#title       Human brain-derived acidic and basic fibroblast growth
              factors: amino terminal sequences and specific mitogenic
              activities.
#cross-references MUID:86186784
#accession    A24243
#molecule_type protein
#residues     16-47 #label GI2
#experimental_source brain
REFERENCE
#authors      Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
#journal      FEBS Lett. (1986) 204:203-207
#title       Partial molecular characterization of endothelial cell
              mitogens from human brain: acidic and basic fibroblast
              growth factors.
#cross-references MUID:86275260
#accession    A24301
#molecule_type protein
#residues     16-30,'X',32-49 #label GAU
REFERENCE
#authors      Gautschi-Sova, P.; Muller, T.; Bohlen, P.
#journal      Biochem. Biophys. Res. Commun. (1986) 140:874-880
#title       Amino acid sequence of human acidic fibroblast growth factor.
#cross-references MUID:87048871
#accession    A26386
#molecule_type protein
#residues     16-155 #label GA2.
#experimental_source brain
REFERENCE
#authors      Chavan, A.J.; Haley, B.E.; Volkin, D.B.; Marfia, K.E.;
              Verticelli, A.M.; Bruner, M.W.; Draper, J.P.; Burke, C.J.;
              Middaugh, C.R.
#journal      Biochemistry (1994) 33:7193-7202
#title       Interaction of nucleotides with acidic fibroblast growth
              factor (FGF-1).
#cross-references MUID:94271773
#accession    A53639
#molecule_type protein
#residues     16-30,'X',32-38;73-75,'X',77-97,'X',99-101;128-131,'X',
              133-140,'X',142-152 #label CHA
GENETICS
#gene         GDB:FGF1; FGFA
#cross-references GDB:119909; OMIM:131220
#map_position 5q31.3-5q33.2
#introns      57/1; 91/3
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS       alternative splicing; growth factor; heparin binding
FEATURE
16-155        #product fibroblast growth factor 1 #status experimental
              #label MAT\
129           #binding_site carbohydrate (Asn) (covalent) #status
              absent
SUMMARY        #length 155 #molecular-weight 17460 #checksum 9243
Query Match    64.7%; Score 984; DB 1; Length 155;
Best Local Similarity 99.3%; Pred. No. 2.00e-192;
Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;
Db 21 GNYKKPLLYCSNGGHFLRLPDGTVDGTRDRSDQHQLQLSAESVGEVIKSTETGYL 80
:|||||
Qy 76 ANYKKPLLYCSNGGHFLRLPDGTVDGTRDRSDQHQLQLSAESVGEVIKSTETGYL 135
:|||||
Db 81 AMDTDGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 140
:|||||
Qy 136 AMDTDGLLYGSQTPNECLFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 195
:|||||
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```

Db 141 GOKAILFLPLPVSSD 155
QY 196 GOKAILFLPLPVSSD 210

RESULT 2
ENTRY #type complete
TITLE acidic fibroblast growth factor - golden hamster
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Mesocricetus auratus #common_name golden hamster
DATE 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 10-Sep-1999
ACCESSIONS A60721
REFERENCE #journal J. Cell. Biochem. (1990) 43:17-26
#authors Hall, J.A.; Harris, M.A.; Malark, M.; Mansson, P.E.; Zhou, H.; Harris, S.E.
#title Characterization of the hamster DDT-1 cell aFGF/HGBF-1 gene and cDNA and its modulation by steroids.
#cross-references MUID:90270291
#accession A60721 not compared with conceptual translation
#status
#molecule_type DNA
#residues 1-155 #label HAL
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17403 #checksum 9573

Query Match 63.5%; Score 967; DB 1; Length 155;
Best Local Similarity 97.0%; Pred. No. 1.76e-188;
Matches 131; Conservative 2; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVGDRSDQHIQLQLSAESAGEVYIKGTGQYL 80
QY 76 ANYKKPKLLYCSNGGHFLRLPDGTVGDRSDQHIQLQLSAESAGEVYIKGTGQYL 135

Db 81 AMDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAEKNWFVGLKNGSKCKRGPRTHY 140
QY 136 AMDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAEKNWFVGLKNGSKCKRGPRTHY 195

Db 141 GOKAILFLPLPVSSD 155
QY 196 GOKAILFLPLPVSSD 210

RESULT 3
ENTRY #type complete
TITLE acidic fibroblast growth factor - mouse
ALTERNATE_NAMES aFGF; FGF-1
ORGANISM #formal_name Mus musculus #common_name house mouse
DATE 16-Jul-1999
ACCESSIONS D37360; JC5231
REFERENCE #journal Dev. Biol. (1990) 138:454-463
#authors Hebert, J.M.; Basilico, C.; Goldfarb, M.; Haub, O.; Martin, G.R.
#title Isolation of cDNAs encoding four mouse FGF family members and characterization of their expression patterns during embryogenesis.
#cross-references MUID:90201563
#accession D37360
#status preliminary
#molecule_type mRNA
#residues 1-155 #label HEB
#cross-references GB:M30641; NID:g193284; PIDN:AAA37618.1; PID:g309236
REFERENCE JC5231
#authors Madial, F.; Hackshaw, K.V.; Chiu, I.M.
#journal Gene (1996) 179:231-236
#title Cloning and characterization of the mouse Fgf-1 gene.
#cross-references MUID:97128312
#accession JC5231
#status preliminary

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#molecule_type DNA
#residues 1-155 #label MAD
#cross-references GB:U36456
COMMENT This protein is an inducer of neovascularization in angiogenic disease including atherosclerosis, cancer and inflammatory autoimmune disease.

GENETICS
#gene Fgf-1
#introns 57/1; 91/3
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341

Query Match 63.5%; Score 966; DB 2; Length 155;
Best Local Similarity 96.3%; Pred. No. 3.00e-188;
Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVGDRSDQHIQLQLSAESAGEVYIKGTGQYL 80
QY 76 ANYKKPKLLYCSNGGHFLRLPDGTVGDRSDQHIQLQLSAESAGEVYIKGTGQYL 135

Db 81 AMDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAEKNWFVGLKNGSKCKRGPRTHY 140
QY 136 AMDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAEKNWFVGLKNGSKCKRGPRTHY 195

Db 141 GOKAILFLPLPVSSD 155
QY 196 GOKAILFLPLPVSSD 210

RESULT 4
ENTRY #type complete
TITLE acidic fibroblast growth factor 1 - rat
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Rattus norvegicus #common_name Norway rat
DATE 28-Feb-1990 #sequence_revision 28-Feb-1990 #text_change 16-Jul-1999
ACCESSIONS S04147
REFERENCE #journal Nucleic Acids Res. (1989) 17:2867
#authors Goodrich, S.P.; Yan, G.C.; Bahrenburg, K.; Mansson, P.E.
#title The nucleotide sequence of rat heparin binding growth factor 1 (HBGF-1).
#cross-references MUID:89240051
#accession S04147
#molecule_type mRNA
#residues 1-155 #label GOO
#cross-references EMBL:X14232; NID:g56351; PIDN:CAA32448.1; PID:g56352
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341

Query Match 63.5%; Score 966; DB 2; Length 155;
Best Local Similarity 96.3%; Pred. No. 3.00e-188;
Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGTVGDRSDQHIQLQLSAESAGEVYIKGTGQYL 80
QY 76 ANYKKPKLLYCSNGGHFLRLPDGTVGDRSDQHIQLQLSAESAGEVYIKGTGQYL 135

Db 81 AMDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAEKNWFVGLKNGSKCKRGPRTHY 140
QY 136 AMDTGLLYGSQTPNEECFLERLEENHYNTYTSKKHAEKNWFVGLKNGSKCKRGPRTHY 195

Db 141 GOKAILFLPLPVSSD 155
QY 196 GOKAILFLPLPVSSD 210

RESULT 5
ENTRY #type fragment
TITLE acidic fibroblast growth factor - pig (fragment)
ORGANISM #formal_name Sus scrofa domestica #common_name domestic pig
DATE 31-Mar-1992 #sequence_revision 31-Mar-1992 #text_change

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16-Jul-1999
ACCESSIONS JH0476; S20072
REFERENCE JH0476
#authors Schmidt, M.; Sharma, H.S.; Schott, R.J.; Schaper, W.
#journal Biochem. Biophys. Res. Commun. (1991) 180:853-859
#title Amplification and sequencing of mRNA encoding acidic
#molecule_type fibroblast growth factor (aFGF) from porcine heart.
#cross-references MUID:92062117
#accession JH0476
##molecule_type mRNA
##residues 1-152 #label SCH
##cross-references EMBL:X60317; NID:g1873; PIDN:CAA42869.1; PID:g1874
##experimental_source heart
##note the hydrophobic core residues are packed around the
internal symmetry axis
COMMENT This protein belongs to the fibroblast growth factor family.
CLASSIFICATION superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
FEATURE
22-28 #region nuclear location signal\
133 #binding_site heparin (Lys) #status predicted
SUMMARY #length 152 #checksum 1124
Query Match 62.6%; Score 953; DB 2; Length 152;
Best Local Similarity 97.0%; Pred. No. 3.09e-185;
Matches 128; Conservative 2; Mismatches 2; Indels 0; Gaps 0;
Db 21 GNYKKPKLLYCSNGHFLRILPDGTVDRSDHQLQLSAESVGEVIKSTGTQYL 80
:|||||
QY 76 ANYKKPKLLYCSNGHFLRILPDGTVDRSDHQLQLSAESVGEVIKSTGTQYL 135
Db 81 AMDTSGLLYSQTPSECLFLERLEENHYNTYTSKKHAENWFVGLKKNKSGCRGRPTHY 140
|||||
QY 136 AMTDGLLYSQTPNEECFLERLEENHYNTYTSKKHAENWFVGLKKNKSGCRGRPTHY 195
Db 141 GQRAILFLPLV 152
QY 196 GQRAILFLPLV 207
RESULT 6
ENTRY #type complete
TITLE acidic fibroblast growth factor precursor - bovine
ALTERNATE_NAMES aFGF; eye-derived growth factor II; heparin-binding growth
factor I; prostatropin
ORGANISM #formal_name Bos primigenius taurus #common_name cattle
DATE 13-Aug-1986 #sequence_revision 03-Feb-1994 #text_change
18-Jun-1999
ACCESSIONS JH0613; S02102; S02065; B24663; A94281; S03953;
A91010; A24477; B25043; C25043; A25043; A24539; A60884;
A37892; B37892; A61198; I46024; A34477; A01385
JH0613
REFERENCE Renaud, F.; Desset, S.; Bugra, K.; Halley, C.; Philippe,
J.M.; Courtois, Y.; Laurent, M.
#journal Biochem. Biophys. Res. Commun. (1992) 184:945-952
#title Heterogeneity of 3' untranslated region of bovine acidic FGF
transcripts.
#cross-references MUID:92246990
#accession JH0613
##molecule_type DNA
##residues 58-155 #label REN
REFERENCE S02102
#authors Halley, C.; Courtois, Y.; Laurent, M.
#journal Nucleic Acids Res. (1988) 16:10913
#title Nucleotide sequence of bovine acidic fibroblast growth factor
cDNA.
#cross-references MUID:89083506
#accession S02102
##molecule_type mRNA
##residues 1-155 #label HAL
##cross-references EMBL:X13221; NID:g347; PIDN:CAA31610.1; PID:g348
REFERENCE S02661
#authors Alterio, J.; Halley, C.; Brou, C.; Soussi, T.; Courtois, Y.;

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Laurent, M.
#journal FEBS Lett. (1988) 242:41-46
#title Characterization of a bovine acidic FGF cDNA clone and its
expression in brain and retina.
#cross-references MUID:89078619
#accession S02661
##molecule_type mRNA
##residues 1-155 #label ALT
##cross-references EMBL:X14032; NID:g322; PIDN:CAA32192.1; PID:g323
REFERENCE S22065
#authors Philippe, J.M.
#submission submitted to the EMBL Data Library, May 1992
#accession S22065
##molecule_type mRNA
##residues 1-18 #label PHI
##cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
REFERENCE A94290
#authors Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman,
J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal Science (1986) 233:545-548
#title Nucleotide sequence of a bovine clone encoding the angiogenic
protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession B24663
##molecule_type mRNA
##residues 62-102 #label ABR
REFERENCE A94281
#authors Gimenez-Gallego, G.; Rodkey, J.; Bennett, C.; Rios-Candelore,
M.; Disalvo, J.; Thomas, K.
#journal Science (1985) 230:1385-1388
#title Brain-derived acidic fibroblast growth factor: complete amino
acid sequence and homologues.
#cross-references MUID:86070224
#accession A94281
##molecule_type protein
##residues 16-155 #label GIM
REFERENCE S03953
#authors Quinkler, W.; Maasberg, M.; Bernotat-Danielowski, S.; Luethe,
N.; Sharma, H.S.; Schaper, W.
#journal Eur. J. Biochem. (1989) 181:67-73
#title Isolation of heparin-binding growth factors from bovine,
porcine and canine hearts.
#cross-references MUID:89231704
#accession S03953
##molecule_type protein
##residues 16-45 #label QUI
REFERENCE A91010
#authors Bohlen, P.; Esch, F.; Baird, A.; Gospodarowicz, D.
#journal EMBO J. (1985) 4:1951-1956
#title Acidic fibroblast growth factor (FGF) from bovine brain:
amino-terminal sequence and comparison with basic FGF.
#cross-references MUID:86055750
#accession A91010
##molecule_type protein
##residues 16-30, 'X', 32-34, 'X', 36-44 #label BOH
REFERENCE A24477
#authors Crabb, J.W.; Armes, L.G.; Carr, S.A.; Johnson, C.M.; Roberts,
G.D.; Bordoli, R.S.; McKeehan, W.L.
#journal Biochemistry (1986) 25:4988-4993
#title Complete primary structure of prostatropin, a prostate
epithelial cell growth factor.
#cross-references MUID:87026586
#accession A24477
##molecule_type protein
##residues 2, 'GE', 5-155 #label CRA
REFERENCE A94127
#authors Burgess, W.H.; Mehlman, T.; Marshak, D.R.; Fraser, B.A.;
Maciag, T.
#journal Proc. Natl. Acad. Sci. U.S.A. (1986) 83:7216-7220
#title Structural evidence that endothelial cell growth factor beta
is the precursor of both endothelial cell growth factor
alpha and acidic fibroblast growth factor.
#cross-references MUID:87016918

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#accession B25043
#molecule_type protein
#residues 2-155 #label BUR
#note this form was designated beta endothelial cell growth factor

#accession C25043
#molecule_type protein
#residues 16-155 #label BU2
#note this form was designated acidic fibroblast growth factor

#accession A25043
#molecule_type protein
#residues 22-155 #label BU3
#note this form was designated alpha endothelial cell growth factor

REFERENCE
A24539
Strydom, D.J.; Harper, J.W.; Lobb, R.R.
Biochemistry (1986) 25:945-951
#journal
#title Amino acid sequence of bovine brain derived class 1 heparin-binding growth factor.
#cross-references MUID:86187766
#accession A24539
#molecule_type protein
#residues 16-155 #label STR

REFERENCE
A60884
Thomas, K.A.; Gimenez-Gallego, G.; Rios-Candelore, M.; DiSalvo, J.
J. Protein Chem. (1987) 6:163-171
#journal
#title Primary structure and mitogenic and angiogenic activities of brain-derived acidic fibroblast growth factor.

#accession A60884
#molecule_type protein
#residues 16-155 #label THO

REFERENCE
A37892
Kuo, M.D.; Huang, S.S.; Huang, J.S.
J. Biol. Chem. (1990) 265:16455-16463
#journal
#title Acidic fibroblast growth factor receptor purified from bovine liver is a novel protein tyrosine kinase.
#cross-references MUID:90375514
#accession A37892
#molecule_type protein
#residues 22-30, 'X', 32-38 #label KU2
#note this form was designated brain-derived growth factor A

#accession B37892
#molecule_type protein
#residues 62-76, 'X', 78-86 #label KUO
#note this sequence is an amino-terminal fragment of a form designated as brain-derived growth factor B

REFERENCE
A61198
Hill, C.E.; Belford, D.A.; Godovac-Zimmermann, J.; Hendry, I.A.
Brain Res. Dev. Brain Res. (1991) 63:13-19
#journal
#title Class 1 heparin binding growth factor promotes the differentiation but not the survival of ciliary neurones in vivo.
#cross-references MUID:92164087
#accession A61198
#molecule_type protein
#residues 11-26; 28-50; 53-110, 'H', 112, 'NYI'; 134-155 #label HIL

REFERENCE
I46024
Philippe, J.M.; Renaud, F.; Desset, S.; Laurent, M.; Mallet, J.; Courtols, Y.; Edwards, J.B.
Biochem. Biophys. Res. Commun. (1992) 188:843-850
#journal
#title Cloning of two different 5' untranslated exons of bovine acidic fibroblast growth factor by the single strand ligation to single-stranded cDNA methodology.
#cross-references MUID:93075172
#accession I46024
#status translated from GB/EMBL/DBJ
#molecule_type mRNA
#residues 1-18 #label PH2
#cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
#accession A34477
Sasaki, H.; Hoshi, H.; Hong, Y.M.; Suzuk, T.; Kato, T.;

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Sasaki, H.; Saito, M.; Youki, H.; Karube, K.; Konno, S.; Onodera, M.; Saito, T.; Aoyagi, S.
J. Biol. Chem. (1989) 264:17608-17612
#journal
#title Purification of acidic fibroblast growth factor from bovine heart and its localization in the cardiac myocytes.
#cross-references MUID:9008933
#accession A34477
#status preliminary
#molecule_type protein
#residues 16-24; 121-127; 134-143 #label SAS
#experimental_source heart

COMMENT
The acidic and basic fibroblast growth factors are the major endothelial-cell growth factors. Both are angiogenic agents in vivo and are potent mitogens for a variety of mesoderm-derived cell types in vitro (although bFGF is 30-100 times more potent than aFGF in stimulating the proliferation of normal diploid cells). There are differences in the tissue distribution and concentration of these two growth factors.

COMMENT
This protein binds heparin, although less strongly than does bFGF. There are some sequence similarities between residues 117-136 (a region flanked by Lys-Lys dipeptides) and a number of neuropeptides, including a gastrin-releasing peptide from the pig

...
Note: remainder of annotations omitted.

Query Match 60.2%; Score 917; DB 1; Length 155;
Best Local Similarity 91.9%; Pred. No. 6,69e-177;
Matches 124; Conservative 6; Mismatches 5; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGYFLRILPDGTVDGTRDSDQHQIQLSAESVGEVIKSTETGQFL 80
QY 76 ANYKKPKLLYCSNGGHFLRILPDGTVDGTRDSDQHQIQLSAESVGEVIKSTETGQYL 135
Db 81 AMDTDGLLYGSQTNEECFLERLEENHYNTYISKKHAEKHWFLVGLKNGSKLGPRTHF 140
QY 136 AMDTDGLLYGSQTNEECFLERLEENHYNTYISKKHAEKHWFLVGLKNGSKLGPRTHF 195
Db 141 GOKAILFLPLPVSSD 155
QY 196 GOKAILFLPLPVSSD 210

RESULT 7
ENTRY A60130 #type complete
TITLE acidic fibroblast growth factor - chicken
ALTERNATE_NAMES endothelial cell growth factor
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE 03-Mar-1993 #sequence_revision 03-Mar-1993 #text_change 16-Jul-1999
ACCESSIONS A60130; S02639
REFERENCE A60130
#authors Schnuerch, H.; Risau, W.
#journal Development (1991) 111:1143-1154
#title Differentiating and mature neurons express the acidic fibroblast growth factor gene during chick neural development
#cross-references MUID:91347925
#accession A60130
#status preliminary
#molecule_type mRNA
#residues 1-155 #label SCH
#cross-references GB:S63263; NID:q234372; PIDN:AAB19629.1; PID:q234373

REFERENCE S02639
#authors Risau, W.; Gautschi-Sova, P.; Boehlen, P.
#journal EMBO J. (1988) 7:959-962
#title Endothelial cell growth factors in embryonic and adult chick brain are related to human acidic fibroblast growth factor.
#cross-references MUID:88296438
#accession S02639
#molecule_type protein
#residues 22-30, 'X', 32-44, 'X', 46-48 #label RIS
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor

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SUMMARY          #length 155 #molecular-weight 17322 #checksum 7617
Query Match      60.28; Score 916; DB 2; Length 155;
Best Local Similarity 90.4%; Pred. No. 1.14e-176;
Matches 122; Conservative 6; Mismatches 7; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHLRLIPDGKVDGTRDSQHIQQLQLSAEDVGEVIKSTETGQYL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 76 ANYKKPKLLYCSNGGHLRLIPDGTVDGTRDSQHIQQLQLSAESVGEVIKSTETGQYL 135
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 81 AMDTNGLLYGSQTPSECLFLERLEENHYNTYISKHADKNWFVGLKKNKSGKLGPRTHY 140
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 136 AMDTDGLLYGSQTPNECLFLERLEENHYNTYISKHAENWFVGLKKNKSGCKRGPRTHY 195
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 141 GQKAILFLPLPVSSD 155
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 196 GQKAILFLPLPVSSD 210
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 8
ENTRY fibroblast growth factor-1 - sheep
TITLE FGF-1
ALTERNATE_NAMES #formal_name Ovis sp. #common_name sheep
ORGANISM 17-Jun-1998 #sequence_revision 10-Jul-1998 #text_change
DATE 07-May-1999
ACCESSIONS JW0055
REFERENCE JW0055
#authors Grieb, T.W.; Ring, M.; Brown, E.; Palmer, C.; Belle, N.;
Donjerkovic, D.; Chang, H.; Yun, J.; Subramanian, R.;
Forozan, F.; Guo, Y.; Vertes, A.; Winkles, J.A.; Burgess,
W.H.
#journal Biochem. Biophys. Res. Commun. (1998) 246:182-191
#title Primary structure of ovine fibroblast growth factor-1 deduced
#cross-references MUID:98262939
#accession JW0055
#molecule_type mRNA
#residues 1-155 #label GRI
COMMENT This protein is a potent mitogenic factor for NIH 3T3 fibroblasts
in the absence of heparin.
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 155 #molecular-weight 17557 #checksum 8890

Query Match 59.58; Score 906; DB 2; Length 155;
Best Local Similarity 90.4%; Pred. No. 2.34e-174;
Matches 122; Conservative 8; Mismatches 5; Indels 0; Gaps 0;

QY 21 GNYKKPKLLYCSNGGHLRLIPDGKVDGTRDSQHIQQLQLSAESVGEVIKSTETGQFL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 76 ANYKKPKLLYCSNGGHLRLIPDGTVDGTRDSQHIQQLQLSAESVGEVIKSTETGQYL 135
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 81 AMDTNGLLYGSQTPSECLFLERLEENHYNTYISKHAENWFVGLKKNKSGKLGPRTHF 140
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 136 AMDTDGLLYGSQTPNECLFLERLEENHYNTYISKHAENWFVGLKKNKSGCKRGPRTHY 195
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 141 GQKAILFLPLPVSSD 155
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 196 GQKAILFLPLPVSSD 210
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 9
ENTRY fibroblast growth factor - mouse
TITLE #formal_name Mus musculus #common_name house mouse
ORGANISM 21-Nov-1993 #sequence_revision 10-Nov-1995 #text_change
DATE 16-Jul-1999
ACCESSIONS S14192; I49665; I49664
REFERENCE S14192
#authors de Lapeyriere, O.; Rosnet, O.; Benharroch, D.; Raybaud, F.;
Marchetto, S.; Planche, J.; Galland, F.; Mattel, M.G.;
Copeland, N.G.; Jenkins, N.A.; Coullier, F.; Birnbaum, D.
#journal Oncogene (1990) 5:823-831

#title Structure, chromosome mapping and expression of the murine
Fgf-6 gene.
#cross-references MUID:90295275
#accession S14192
#molecule_type DNA
#residues 1-208 #label LAP
#cross-references EMBL:X51552
#note it is uncertain whether Met-1 or Met-11 is the initiator
REFERENCE I49664
#authors Ollendorff, V.; Rosnet, O.; Marics, I.; Birnbaum, D.;
deLapeyriere, O.
#journal Biochimie (1992) 74:1035-1038
#title Isolation and sequence of the murine Fgf6 cDNA.
#cross-references MUID:93120244
#accession I49665
#status preliminary; translated from GB/EMBL/DBJ
#molecule_type mRNA
#residues 19-208 #label RES
#cross-references GB:M92416; NID:g193288; PIDN:AAA62261.1; PID:g666915
#accession I49664
#status preliminary; translated from GB/EMBL/DBJ
#molecule_type DNA
#residues 1-18 #label RE2
#cross-references GB:M92415; NID:g193286; PIDN:AAA62260.1; PID:g193287
GENETICS
#gene Fgf6
#introns 116/1; 150/3
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 208 #molecular-weight 22798 #checksum 6314
Query Match 46.1%; Score 702; DB 2; Length 208;
Best Local Similarity 55.6%; Pred. No. 1.66e-127;
Matches 114; Conservative 31; Mismatches 50; Indels 10; Gaps 6;

Db 11 MSRGAGRVGTTQALVFLGVLMVVPSPAGARANGTLLDSRGWGTLLSRSLAGAEIS 70
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 1 MSRGAGRVGTTQALVFLGVLMVVPSPAGARANGTLLDSRGWGTLLSRSLAGAEIS 60
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 71 GYNWESGYLVGKRO----R-RL-YCNVIGIHFHQVPPDGRISGTHE-ENPYSLLLEISTV 123
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 61 GYNWESGYLVGKROANYKKPKLLYCSNGGHL-RLIPDGTVDGTRDSQHIQQLSAE 119
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 124 ERGVYSLGVKQKALFIAMNSKGLRTTPSFHDECKFRETLLPNYNNAYESDLYRGT--YI 181
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 120 SVGEVYIKSTETGQYLAAMTDGLLYGSQTPNECLFLERLEENHYNTYISKHAENWFV 179
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 182 ALSKYGRVKGSKVSPIMTVTHFLP 206
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 180 GLKKNKSGCKRGPRTHYQKAILFLP 204
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 10
ENTRY #type complete
TITLE fibroblast growth factor 6 precursor - human
ALTERNATE_NAMES fibroblast growth factor-related protein FGF.6; transforming
protein hst-2
ORGANISM #formal_name Homo sapiens #common_name man
DATE 18-Aug-1994 #sequence_revision 12-Apr-1996 #text_change
ACCESSIONS S20102; S23739; S04204; S36910
REFERENCE S20102
#authors Coullier, F.; Batoz, M.; Marics, I.; de Lapeyriere, O.;
Birnbaum, D.
#journal Oncogene (1991) 6:1437-1444
#title Putative structure of the FGF6 gene product and role of the
signal peptide.
#cross-references MUID:91360279
#accession S20102
#status not compared with conceptual translation
#molecule_type DNA
#residues 1-208 #label COU
#cross-references EMBL:X57075
#note it is uncertain whether Met-1, Met-11 or Met-34 is the

```



```
REFERENCE S23739 initiator
#authors Iida, S.; Yoshida, T.; Naito, K.; Sakamoto, H.; Katoh, O.;
#journal Hirohashi, S.; Sato, T.; Onda, M.; Sugimura, T.; Terada, M.
#title Oncogene (1992) 7:303-309
#cross-references MUID:92195660
#accession S23739
#molecule_type mRNA
#residues 1-208 #label IID
#cross-references EMBL:X63454
#note It is uncertain whether Met-1 or Met-11 is the initiator
#accession S04204
#authors Marics, I.; Adelaide, J.; Raybaud, F.; Mattei, M.G.; Coulier,
#journal F.; Planche, J.; de Lapeyriere, O.; Birnbaum, D.
#title Oncogene (1989) 4:335-340
#title Characterization of the HSP-related FGF-6 gene, a new member
of the fibroblast growth factor gene family.
#cross-references MUID:89201880
#accession S04204
#molecule_type DNA
#residues 81-99, 'G', 101-208 #label MAR
#cross-references EMBL:X14071
GENETICS
#gene GDB:FGF6; hst-2
#cross-references GDB:119908; OMIM:134921
#map_position 12p13-12p13
#introns 115/3; 150/2
CLASSIFICATION #superfamily fibroblast growth factor
FEATURE
1-40 #domain (or 11-40 or 34-40) signal sequence #status
predicted #label SIG
#product fibroblast growth factor 6 #status predicted
#label MAT
SUMMARY #length 208 #molecular-weight 22904 #checksum 6745
Query Match 44.7%; Score 681; DB 2; Length 208;
Best Local Similarity 53.7%; Pred. No. 1.00e-122;
Matches 110; Conservative 35; Mismatches 50; Indels 10; Gaps 7;
Db 11 MSRGAGRQGTLMALVFLGVLGVMPVSPAGTRANNLLDSRGVTLSSRAGLAGEIA 70
QY 1 MSRGAGRQGTLMALVFLGVLGVMPVSPAGTRANNLLDSRGVTLSSRAGLAGEIS 60
Db 71 GVNWESGLVCIKRO---R-RL-YCNVIGFHLQVLPDGRISCTHE-ENPYSLLLEISTV 123
QY 61 GVNWESGLVCIKROQYKQYKPKLLYCSNGGHF-LRILPDGTVGTRDRSDQHIQQLLSAE 119
Db 124 ERGVVSLFGVRSALFVAMNSKGRLYATPSFOECKFRETLLPNNYAYESDLY-QGT-YI 181
QY 120 SVGEVYIKSTGTGYLANDTGLYGSTPNEECFLERLEENHYNTYISKHAEKNWFV 179
Db 182 ALSKYGRKRGSKVSPIMTVTHFLP 206
QY 180 GLKKNKSGRGRPHYGOKAILFLP 204
RESULT 11
ENTRY A48834 #type complete
TITLE basic fibroblast growth factor - chicken
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE 01-Dec-1993 #sequence_revision 18-Nov-1994 #text_change
16-Jul-1999
ACCESSIONS A48834
REFERENCE A48834
#authors Borja, A.Z.; Meijers, C.; Zeller, R.
#journal Dev. Biol. (1993) 157:110-118
#title Expression of alternatively spliced bFGF first coding exons
and antisense mRNAs during chicken embryogenesis.
#cross-references MUID:93246053
#accession A48834
#status preliminary
```

```
##molecule_type nucleic acid
##residues 1-189 #label BOR
##experimental_source embryo
##note sequence extracted from NCBI backbone (NCBIN:131000,
NCBIP:131001)
REFERENCE S23636
#authors Mitranl, E.; Gruenbaum, Y.; Shohat, H.; Ziv, T.
#journal Development (1990) 109:387-393
#title Fibroblast growth factor during mesoderm induction in the
early chick embryo.
#cross-references MUID:90382254
#accession S23636
#status preliminary
##molecule_type DNA
##residues 95-128 #label MIT
##cross-references EMBL:X56804; NID:g62855; PIDN:CAA40139.1; PID:g62856
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 189 #molecular-weight 20312 #checksum 8538
Query Match 34.3%; Score 522; DB 2; Length 189;
Best Local Similarity 54.5%; Pred. No. 6.67e-87;
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;
Db 58 GHFKDPKRLYCKNGGFFLRINPDGRVDGVRKSDPHIKLQAEERGVSIGVSNREL 117
QY 76 ANYKPKLLYCSNGGHFLRILPDGTVGTRDRSDQHIQQLLSAESVGEYIKSTGTGYL 135
Db 118 AMKEDGRLLKALCAECCFFERLESNNYNTYRSKYS--WYVALKRTGQYKPGKTP 175
QY 136 AMDTGLLYGSGTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGRGRPHY 195
Db 176 GOKAILFLPMSAKS 189
QY 196 GOKAILFLPLPVSS 209
RESULT 12
ENTRY S00185 #type complete
TITLE basic fibroblast growth factor - sheep
ALTERNATE_NAMES prostatropin
ORGANISM #formal_name Ovis orientalis aries, Ovis ammon aries
#common_name domestic sheep
DATE 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change
10-Sep-1999
ACCESSIONS S00185
REFERENCE S00185
#authors Simpson, R.J.; Moritz, R.L.; Lloyd, C.J.; Fabri, L.J.; Nice,
E.C.; Rubira, M.R.; Burgess, A.W.
#journal FEBS Lett. (1987) 224:128-132
#title Primary structure of ovine pituitary basic fibroblast growth
factor.
#cross-references MUID:88055577
#accession S00185
##molecule_type protein
##residues 1-146 #label SIM
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding; mitogen
FEATURE
18-22 #region heparin binding #status predicted\
107-110 #region heparin binding #status predicted
SUMMARY #length 146 #molecular-weight 16434 #checksum 3560
Query Match 33.9%; Score 516; DB 1; Length 146;
Best Local Similarity 55.2%; Pred. No. 1.45e-85;
Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;
Db 15 GHFKDPKRLYCKNGGFFLRINPDGRVDGVRKSDPHIKLQAEERGVSIGVSNREL 74
QY 76 ANYKPKLLYCSNGGHFLRILPDGTVGTRDRSDQHIQQLLSAESVGEYIKSTGTGYL 135
Db 75 AMKEDGRLLKALCAECCFFERLESNNYNTYRSKYS--WYVALKRTGQYKPGKTP 132
QY 136 AMDTGLLYGSGTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGRGRPHY 195
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Db 133 GOKAILFLPMGSAKS 146
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Qy 196 GOKAILFLPLPVSS 209

RESULT 13
ENTRY GKB0B #type fragment
TITLE basic fibroblast growth factor precursor - bovine (fragment)
ALTERNATE_NAMES bFGF: kidney-derived growth factor; prostathropin
ORGANISM #formal_name Bos primigenius taurus #common_name cattle
DATE 13-Aug-1986 #sequence_revision 02-Jun-1995 #text_change
10-Sep-1999
ACCESSIONS A24663: A32878; A33784; A61550; A61551; A60310; A61094;
A01386; A60316; A22054; A24819
A94290
REFERENCE
#authors Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman,
J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal Science (1986) 233:545-548
#title Nucleotide sequence of a bovine clone encoding the angiogenic
protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession A24663
##molecule_type mRNA
##residues 3-157 #label ABR
##cross-references GB:M13440; NID:g163049; PIDN:AAA30518.1; PID:g163050
##experimental_source pituitary gland
REFERENCE
#authors Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes,
J.C.
#journal Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668
#title Human basic fibroblast growth factor: nucleotide sequence,
genomic organization, and expression in mammalian cells.
#cross-references MUID:87217066
#accession A32878
##molecule_type mRNA
##residues 3-157 #label AB2
REFERENCE
#authors Milner, P.G.; Li, Y.S.; Hoffman, R.M.; Kodner, C.M.; Siegel,
N.R.; Deuel, T.F.
#journal Biochem. Biophys. Res. Commun. (1989) 165:1096-1103
#title A novel 17 kD heparin-binding growth factor (HBGF-8) in
bovine uterus: purification and N-terminal amino acid
sequence
#cross-references MUID:90121211
#accession A33784
##molecule_type protein
##residues 1-14 #label MIL
#note demonstration of a possible alternative initiator or
splice junction
REFERENCE
A61550
#authors Bertolini, J.; Hearn, M.T.W.
#journal Mol. Cell. Endocrinol. (1987) 51:187-199
#title Isolation, characterisation and tissue localisation of an
N-terminal-truncated variant of fibroblast growth factor.
#cross-references MUID:87247652
#accession A61550
##molecule_type protein
##residues 16-35 #label BER
REFERENCE
A61551
#authors Ueno, N.; Baird, A.; Esch, F.; Ling, N.; Guillemin, R.
#journal Mol. Cell. Endocrinol. (1987) 49:189-194
#title Isolation and partial characterization of basic fibroblast
growth factor from bovine testis.
#cross-references MUID:87162856
#accession A61551
##molecule_type protein
##residues 27-35, 'X', 37-41 #label UE3
##experimental_source testes
#note This form appears to be identical to the renal form
REFERENCE
A60310
#authors Ueno, N.; Baird, A.; Esch, F.; Shimasaki, S.; Ling, N.;
Guillemin, R.
#journal Regul. Pept. (1986) 16:135-145
#title Purification and partial characterization of a mitogenic
factor from bovine liver: structural homology with basic
fibroblast growth factor.
#cross-references MUID:87119165
#accession A60310
##molecule_type protein
##residues 23-35, 'X', 37-42 #label UEN
##experimental_source liver
REFERENCE
A24819
#authors Ueno, N.; Baird, A.; Esch, F.; Ling, N.; Guillemin, R.
#journal Biochem. Biophys. Res. Commun. (1986) 138:580-588
#title Isolation of an amino terminal extended form of basic
fibroblast growth factor.
#cross-references MUID:86295737
#contents annotation
#note the amino end of this form was blocked; the peptide
composition matched what was thought to be the signal
sequence
REFERENCE
A61094
#authors Gospodarowicz, D.; Baird, A.; Cheng, J.; Lui, G.M.; Esch, F.;
Bohlen, P.
#journal Endocrinology (1986) 118:82-90
#title Isolation of fibroblast growth factor from bovine adrenal
gland: physicochemical and biological characterization.
#cross-references MUID:86081530
#accession A61094
##molecule_type protein
##residues 12-25, 27-35, 'X', 37-40 #label GOS
##experimental_source adrenal gland
REFERENCE
A01386
#authors Esch, F.; Baird, A.; Ling, N.; Ueno, N.; Hill, F.; Denoroy,
L.; Klepper, R.; Gospodarowicz, D.; Bohlen, P.; Guillemin,
R.
#journal Proc. Natl. Acad. Sci. U.S.A. (1985) 82:6507-6511
#title Primary structure of bovine pituitary basic fibroblast growth
factor (FGF) and comparison with the amino-terminal
sequence of bovine brain acidic FGF.
#cross-references MUID:86016731
#accession A01386
##molecule_type protein
##residues 12-157 #label ESC
##experimental_source pituitary gland
REFERENCE
A60316
#authors Baird, A.; Esch, F.; Bohlen, P.; Ling, N.; Gospodarowicz, D.
#journal Regul. Pept. (1985) 12:201-213
#title Isolation and partial characterization of an endothelial cell
growth factor from the bovine kidney: homology with basic
fibroblast growth factor.
#cross-references MUID:86095426
#accession A60316
##molecule_type protein
##residues 27-35, 'X', 37-43 #label BAI
##experimental_source kidney
REFERENCE
A22054
#authors Bohlen, P.; Baird, A.; Esch, F.; Ling, N.; Gospodarowicz, D.
#journal Proc. Natl. Acad. Sci. U.S.A. (1984) 81:5364-5368
#title Isolation and partial molecular characterization of pituitary
fibroblast growth factor.
#cross-references MUID:84298139
#accession A22054
##molecule_type protein
##residues 12-26 #label BOH
#note The acidic and basic fibroblast growth factors are the major
endothelial-cell growth factors. Both are angiogenic agents in
vivo and are potent mitogens for a variety of mesoderm-derived
cell types in vitro (although bFGF is 30-100 times more potent
than aFGF in stimulating the proliferation of normal diploid
cells).
#comment This protein binds heparin more strongly than does aFGF.
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS alternative splicing; angiogenesis; growth factor; heparin
binding; mitogen

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Search completed: Tue Aug 29 16:13:14 2000  
Job time : 70 secs.



\*\*\*\*\*  
MPSrch\_pp protein - protein database search, using Smith-Waterman algorithm  
Run on: Tue Aug 29 16:10:16 2000; MasPar time 8.09 Seconds  
804.050 Million cell updates/sec  
bular output not generated.  
Title: >US-09-121-017B-27-  
Description: (1-210) from US09121017B.pep  
Perfect Score: 1522  
Sequence: 1 MSRGAGRVQGTQALVELGV.....PRTHYGKAILFLPLPVSSD 210  
Scoring table: PAM 150  
Gap 11  
Searched: 85661 seqs, 30989116 residues  
Post-processing: Minimum Match 08  
Listing first 45 summaries  
Database: swiss-prot38  
1:swissprot  
Statistics: Mean 45.430; Variance 71.241; scale 0.638  
Pred. No. is the number of results predicted by chance to have a  
score greater than or equal to the score of the result being printed,  
and is derived by analysis of the total score distribution.  
SUMMARIES  
Result No. Score Match Length DB ID Description Pred. No.  
1 984 64.7 155 1 FGFL\_HUMAN HEPARIN-BINDING GROWTH 1.76e-219  
2 967 63.5 155 1 FGFL\_MESAO HEPARIN-BINDING GROWTH 5.53e-215  
3 966 63.5 155 1 FGFL\_MOUSE HEPARIN-BINDING GROWTH 1.02e-214  
4 953 62.6 152 1 FGFL\_PIG HEPARIN-BINDING GROWTH 2.78e-211  
5 917 60.2 155 1 FGFL\_BOVIN HEPARIN-BINDING GROWTH 8.84e-202  
6 916 60.2 155 1 FGFL\_CHICK HEPARIN-BINDING GROWTH 1.62e-201  
7 702 46.1 208 1 FGFL\_MOUSE FIBROBLAST GROWTH FACT 1.78e-145  
8 681 44.7 208 1 FGFL\_HUMAN FIBROBLAST GROWTH FACT 5.00e-140  
9 522 34.3 158 1 FGFL\_CHICK HEPARIN-BINDING GROWTH 3.26e-99  
10 516 33.9 155 1 FGFL\_SHEEP HEPARIN-BINDING GROWTH 1.08e-97  
11 516 33.9 155 1 FGFL\_BOVIN HEPARIN-BINDING GROWTH 1.08e-97  
12 508 33.4 154 1 FGFL\_MOUSE HEPARIN-BINDING GROWTH 1.15e-95  
13 508 33.4 154 1 FGFL\_RAT HEPARIN-BINDING GROWTH 1.15e-95  
14 509 33.4 155 1 FGFL\_HUMAN HEPARIN-BINDING GROWTH 6.44e-96  
15 498 32.7 156 1 FGFL\_MONDO HEPARIN-BINDING GROWTH 3.89e-93  
16 489 32.1 155 1 FGFL\_XENLA HEPARIN-BINDING GROWTH 7.27e-91  
17 466 30.6 137 1 FGFL\_RABIT FIBROBLAST GROWTH FACT 4.45e-85  
18 375 24.7 192 1 FGFL\_XENLA FIBROBLAST GROWTH FACT 9.49e-63  
19 361 23.7 209 1 FGFL\_XENLA GLIA-ACTIVATING FACTOR 4.30e-59  
20 350 23.0 208 1 FGFL\_MOUSE GLIA-ACTIVATING FACTOR 2.05e-56  
21 350 23.0 208 1 FGFL\_RAT GLIA-ACTIVATING FACTOR 2.05e-56  
22 350 23.0 208 1 FGFL\_HUMAN GLIA-ACTIVATING FACTOR 2.05e-56  
23 341 22.4 187 1 FGFL\_XENLA FIBROBLAST GROWTH FACT 3.09e-54

\*\*\*\*\*  
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MPSrch\_pp protein - protein database search, using Smith-Waterman algorithm  
Run on: Tue Aug 29 16:10:16 2000; MasPar time 8.09 Seconds  
804.050 Million cell updates/sec  
bular output not generated.  
Title: >US-09-121-017B-27-  
Description: (1-210) from US09121017B.pep  
Perfect Score: 1522  
Sequence: 1 MSRGAGRVQGTQALVELGV.....PRTHYGKAILFLPLPVSSD 210  
Scoring table: PAM 150  
Gap 11  
Searched: 85661 seqs, 30989116 residues  
Post-processing: Minimum Match 08  
Listing first 45 summaries  
Database: swiss-prot38  
1:swissprot  
Statistics: Mean 45.430; Variance 71.241; scale 0.638  
Pred. No. is the number of results predicted by chance to have a  
score greater than or equal to the score of the result being printed,  
and is derived by analysis of the total score distribution.  
SUMMARIES  
Result No. Score Match Length DB ID Description Pred. No.  
1 984 64.7 155 1 FGFL\_HUMAN HEPARIN-BINDING GROWTH 1.76e-219  
2 967 63.5 155 1 FGFL\_MESAO HEPARIN-BINDING GROWTH 5.53e-215  
3 966 63.5 155 1 FGFL\_MOUSE HEPARIN-BINDING GROWTH 1.02e-214  
4 953 62.6 152 1 FGFL\_PIG HEPARIN-BINDING GROWTH 2.78e-211  
5 917 60.2 155 1 FGFL\_BOVIN HEPARIN-BINDING GROWTH 8.84e-202  
6 916 60.2 155 1 FGFL\_CHICK HEPARIN-BINDING GROWTH 1.62e-201  
7 702 46.1 208 1 FGFL\_MOUSE FIBROBLAST GROWTH FACT 1.78e-145  
8 681 44.7 208 1 FGFL\_HUMAN FIBROBLAST GROWTH FACT 5.00e-140  
9 522 34.3 158 1 FGFL\_CHICK HEPARIN-BINDING GROWTH 3.26e-99  
10 516 33.9 155 1 FGFL\_SHEEP HEPARIN-BINDING GROWTH 1.08e-97  
11 516 33.9 155 1 FGFL\_BOVIN HEPARIN-BINDING GROWTH 1.08e-97  
12 508 33.4 154 1 FGFL\_MOUSE HEPARIN-BINDING GROWTH 1.15e-95  
13 508 33.4 154 1 FGFL\_RAT HEPARIN-BINDING GROWTH 1.15e-95  
14 509 33.4 155 1 FGFL\_HUMAN HEPARIN-BINDING GROWTH 6.44e-96  
15 498 32.7 156 1 FGFL\_MONDO HEPARIN-BINDING GROWTH 3.89e-93  
16 489 32.1 155 1 FGFL\_XENLA HEPARIN-BINDING GROWTH 7.27e-91  
17 466 30.6 137 1 FGFL\_RABIT FIBROBLAST GROWTH FACT 4.45e-85  
18 375 24.7 192 1 FGFL\_XENLA FIBROBLAST GROWTH FACT 9.49e-63  
19 361 23.7 209 1 FGFL\_XENLA GLIA-ACTIVATING FACTOR 4.30e-59  
20 350 23.0 208 1 FGFL\_MOUSE GLIA-ACTIVATING FACTOR 2.05e-56  
21 350 23.0 208 1 FGFL\_RAT GLIA-ACTIVATING FACTOR 2.05e-56  
22 350 23.0 208 1 FGFL\_HUMAN GLIA-ACTIVATING FACTOR 2.05e-56  
23 341 22.4 187 1 FGFL\_XENLA FIBROBLAST GROWTH FACT 3.09e-54

ALIGNMENTS

RESULT 1  
ID FGFL\_HUMAN STANDARD: PRT: 155 AA.  
AC P05230; P07502;  
DT 13-AUG-1987 (Rel. 05, Created)  
DT 13-AUG-1987 (Rel. 05, Last sequence update)  
DT 15-JUL-1999 (Rel. 38, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST  
DE GROWTH FACTOR) (AFGF) (BETA-ENDOTHELIAL CELL GROWTH FACTOR) (ECGF-  
DE BETA).  
GN FGFL OR FGFA.  
OS Homo sapiens (Human).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.  
RN [1]  
RP SEQUENCE FROM N.A.  
RX MEDLINE; 86261805.  
RA Jaye M., Howk R., Burgess W., Ricca G.A., Chiu I.-M., Ravera M.W.,  
RA O'Brien S.J., Modi W.S., Maciag T., Drohan W.N.;  
RT "Human endothelial cell growth factor: cloning, nucleotide sequence,  
RT and chromosome localization."  
RL Science 233:541-545(1986).  
RN [2]  
RP SEQUENCE FROM N.A.  
RX TISSUE-BRAIN STEM;  
RX MEDLINE; 89343957.  
RA Wang W.P., Lehtoma K., Varban M.L., Krishnan I., Chiu I.M.;  
RT "Cloning of the gene coding for human class I heparin-binding growth  
RT factor and its expression in fetal tissues."  
RL Mol. Cell. Biol. 9:2387-2395(1989).  
RN [3]  
RP SEQUENCE FROM N.A.  
RX TISSUE-BRAIN STEM;  
RX MEDLINE; 90265618.  
RA Chiu I.M., Wang W.P., Lehtoma K.;  
RT "Alternative splicing generates two forms of mRNA coding for human  
RT heparin-binding growth factor 1."  
RL Oncogene 5:755-762(1990).  
RN [4]  
RP SEQUENCE FROM N.A.  
RX MEDLINE; 90073637.  
RA Mergia A., Tischer E., Graves D., Tumolo A., Miller J.,  
RA Gospodarowicz D., Abraham J.A., Shipley G.D., Fiddes J.C.;  
RT "Structural analysis of the gene for human acidic fibroblast growth  
RT factor.";  
RL Biochem. Biophys. Res. Commun. 164:1121-1129(1989).  
RN [5]  
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24 329 21.6 207 1 FGFL\_HUMAN FIBROBLAST GROWTH FACT 2.40e-51  
25 324 21.3 207 1 FGFL\_RAT FIBROBLAST GROWTH FACT 3.80e-50  
26 310 20.4 194 1 FGFL\_CHICK FIBROBLAST GROWTH FACT 8.38e-47  
27 307 20.2 206 1 FGFL\_BOVIN FIBROBLAST GROWTH FACT 4.33e-46  
28 302 19.8 194 1 FGFL\_SHEEP KERATINOCYTE GROWTH FA 6.06e-45  
29 299 19.6 194 1 FGFL\_HUMAN KERATINOCYTE GROWTH FA 3.42e-44  
30 295 18.4 194 1 FGFL\_MOUSE KERATINOCYTE GROWTH FA 3.01e-43  
31 279 18.3 264 1 FGFL\_MOUSE FIBROBLAST GROWTH FACT 1.73e-39  
32 277 18.2 208 1 FGFL\_HUMAN FIBROBLAST GROWTH FACT 5.06e-39  
33 277 18.2 215 1 FGFL\_RAT FIBROBLAST GROWTH FACT 5.06e-39  
34 277 18.2 266 1 FGFL\_MOUSE FIBROBLAST GROWTH FACT 5.06e-39  
35 274 18.0 247 1 FGFL\_MOUSE FIBROBLAST GROWTH FACT 2.53e-38  
36 272 17.9 206 1 FGFL\_HUMAN FIBROBLAST GROWTH FACT 7.39e-38  
37 273 17.9 209 1 FGFL\_MOUSE FIBROBLAST GROWTH FACT 4.33e-38  
38 273 17.9 247 1 FGFL\_HUMAN FIBROBLAST GROWTH FACT 4.33e-38  
39 271 17.8 194 1 FGFL\_RAT KERATINOCYTE GROWTH FA 1.26e-37  
40 269 17.7 268 1 FGFL\_HUMAN FIBROBLAST GROWTH FACT 3.88e-37  
41 266 17.5 256 1 FGFL\_BRARE FIBROBLAST GROWTH FACT 1.83e-36  
42 263 17.3 225 1 FGFL\_HUMAN FIBROBLAST GROWTH FACT 9.02e-36  
43 257 16.9 225 1 FGFL\_MOUSE FIBROBLAST GROWTH FACT 2.18e-34  
44 256 16.8 202 1 FGFL\_MOUSE FIBROBLAST GROWTH FACT 3.70e-34  
45 256 16.3 243 1 FGFL\_HUMAN FIBROBLAST GROWTH FACT 3.70e-34

RT MEDLINE; 92019819.  
 RA Wang W.P., Quick D., Balcerzak S.P., Needleman S.W., Chiu I.M.;  
 RT "Cloning and sequence analysis of the human acidic fibroblast growth  
 RT factor gene and its preservation in leukemia patients.";  
 RN Oncogene 6:1521-1529(1991).  
 [6]  
 RN SEQUENCE FROM N.A.  
 RP MEDLINE; 9202857.  
 RA Li Y.L., Kha H., Golden J.A., Migchelsen A.A.J., Goetzl E.J.,  
 RA Turk E.J.;  
 RT "An acidic fibroblast growth factor protein generated by alternate  
 RT splicing acts like an antagonist.";  
 RL J. Exp. Med. 175:1073-1080(1992).  
 [7]  
 RN SEQUENCE OF 1-154 FROM N.A.  
 RP MEDLINE; 94069734.  
 RA Zhao X.M., Yeoh T.K., Hiebert M., Frist W.H., Miller G.G.;  
 RT "The expression of acidic fibroblast growth factor (heparin-binding  
 RT growth factor-1) and cytokine genes in human cardiac allografts and T  
 RT cells.";  
 RL Transplantation 56:1177-1182(1993).  
 [8]  
 RN SEQUENCE OF 1-40 FROM N.A.  
 RP MEDLINE; 90365758.  
 RA Crumley G., Dionne C.A., Jaye M.;  
 RT "The gene for human acidic fibroblast growth factor encodes two  
 RT upstream exons alternatively spliced to the first coding exon.";  
 RL Biochem. Biophys. Res. Commun. 171:7-13(1990).  
 [9]  
 RN SEQUENCE OF 16-155.  
 RP MEDLINE; 86296647.  
 RA Harper J.W., Strydom D.J., Lobb R.R.;  
 RT "Human class I heparin-binding growth factor: structure and homology  
 RT to bovine acidic brain fibroblast growth factor.";  
 RL Biochemistry 25:4097-4103(1986).  
 [10]  
 RN SEQUENCE OF 16-155.  
 RP MEDLINE; 86295741.  
 RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;  
 RT "The complete amino acid sequence of human brain-derived acidic  
 RT fibroblast growth factor.";  
 RL Biochem. Biophys. Res. Commun. 138:611-617(1986).  
 [11]  
 RN SEQUENCE OF 16-155.  
 RP MEDLINE; 87048871.  
 RA Gutschli-Sova P., Mueller T., Boehlen P.;  
 RT "Amino acid sequence of human acidic fibroblast growth factor.";  
 RL Biochem. Biophys. Res. Commun. 140:874-880(1986).  
 [12]  
 RN SEQUENCE OF 16-47.  
 RP MEDLINE; 86186784.  
 RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;  
 RT "Human brain-derived acidic and basic fibroblast growth factors:  
 RT amino terminal sequences and specific mitogenic activities.";  
 RL Biochem. Biophys. Res. Commun. 135:541-548(1986).  
 [13]  
 RN SEQUENCE OF 16-49.  
 RP MEDLINE; 86275260.  
 RA Gutschli P., Frater-Schroeder M., Boehlen P.;  
 RT "Partial molecular characterization of endothelial cell mitogens from  
 RT human brain: acidic and basic fibroblast growth factors.";  
 RL FEBS Lett. 204:203-207(1986).  
 [14]  
 RN X-RAY CRYSTALLOGRAPHY (2.0 ANGSTROMS).  
 RP MEDLINE; 96194129.  
 RA Blaber M., Disalvo J., Thomas K.A.;  
 RT "X-ray crystal structure of human acidic fibroblast growth factor.";  
 RL Biochemistry 35:2086-2094(1996).  
 [15]  
 RN STRUCTURE BY NMR OF 24-155.  
 RP MEDLINE; 94358885.  
 RA Pineda-Lucena A., Gimenez M.A., Nieto J.L., Santoro J., Rico M.,  
 RA Gimenez-Gallego G.;

RT "1H-NMR assignment and solution structure of human acidic fibroblast  
 RT growth factor activated by inositol hexasulfate.";  
 RL J. Mol. Biol. 242:81-98(1994).  
 [16]  
 RN STRUCTURE BY NMR OF 24-155.  
 RP MEDLINE; 97107535.  
 RA Pineda-Lucena A., Gimenez M.A., Lozano R.M., Nieto J.L., Santoro J.,  
 RA Rico M., Gimenez-Gallego G.;  
 RT "Three-dimensional structure of acidic fibroblast growth factor in  
 RT solution: effects of binding to a heparin functional analog.";  
 RL J. Mol. Biol. 264:162-178(1996).  
 [17]  
 RN STRUCTURE BY NMR OF 25-155.  
 RP MEDLINE; 98387896.  
 RA Lozano R.M., Gimenez M., Santoro J., Rico M., Gimenez-Gallego G.;  
 RT "Solution structure of acidic fibroblast growth factor bound to 1,3,  
 RT 6-naphthalenesulfonate: a minimal model for the anti-tumoral  
 RT action of suramin and suradistas.";  
 RL J. Mol. Biol. 281:899-915(1998).  
 CC 1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
 CC 1- SUBUNIT: MONOMER.  
 CC 1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY  
 CC THAN DOES BFGF.  
 CC 1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
 CC -----  
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 CC or send an email to [license@isb-sib.ch](mailto:license@isb-sib.ch)).  
 CC -----  
 DR EMBL; M1361; AAA79245.1;  
 DR EMBL; X51943; CAA36206.1;  
 DR EMBL; M30492; AAA52446.1;  
 DR EMBL; M30490; AAA52446.1; JOINED.  
 DR EMBL; M30491; AAA52446.1; JOINED.  
 DR EMBL; M60515; AAA51672.1;  
 DR EMBL; M60516; AAA51673.1;  
 DR EMBL; M23087; AAA52638.1;  
 DR EMBL; M23086; AAA52638.1; JOINED.  
 DR EMBL; S67291; AAB29057.1;  
 DR PIR; A23553; A23553.  
 DR PIR; A24243; A24243.  
 DR PIR; A24301; A24301.  
 DR PIR; A24662; A24662.  
 DR PIR; A24820; A24820.  
 DR PIR; A26386; A26386.  
 DR PIR; A33665; A33665.  
 DR PIR; S18217; S18217.  
 DR PDB; 2AEG; 15-OCT-95.  
 DR PDB; 1AXM; 22-APR-98.  
 DR PDB; 2AXM; 22-APR-98.  
 DR PDB; 1RML; 11-NOV-98.  
 DR MIM; 131220;  
 DR PFAM; PF00167; FGF; 1.  
 DR PRINTS; PR00262; ILIHGFG.  
 DR PRINTS; PR00263; HBGF; FGF.  
 DR PROSITE; PS00247; HBGF\_FGF; 1.  
 KW Growth factor; Mitogen; Vascularization; Heparin-binding; Acetylation;  
 KW 3D-structure.  
 FT PROPEP 1 15  
 FT CHAIN 16 155 HEPARIN-BINDING GROWTH FACTOR 1.  
 FT MOD\_RES 2 2 ACETYLATION.  
 FT BINDING 24 28 HEPARIN (POTENTIAL).  
 FT BINDING 113 116 HEPARIN (POTENTIAL).  
 FT SEQUENCE 155 AA; 17460 MW; F586E8BF09F1580 CRC64;  
 SQ

Query Match 64.78; Score 984; DB 1; Length 155;  
 Best Local Similarity 99.3%; Pred. No. 1.76e-219;  
 Matches 134; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

Db 21 GNYKKKLLYCSNGGHFLRLPDGTGTRDSQHQIQLSASGEVYIKSTETGQYL 80  
 QY :|||||  
 76 ANYKKKLLYCSNGGHFLRLPDGTGTRDSQHQIQLSASGEVYIKSTETGQYL 135  
 :|||||  
 Db 81 AMDTGLLYGSQTPNECEFLERLEENHNNTYISKHAENWVGLKKNCKRGPRTHY 140  
 QY :|||||  
 136 AMDTGLLYGSQTPNECEFLERLEENHNNTYISKHAENWVGLKKNCKRGPRTHY 195  
 :|||||  
 Db 141 GQKAILFLPLPVSSD 155  
 QY :|||||  
 196 GQKAILFLPLPVSSD 210  
 :|||||

RESULT 2  
 ID FGF1\_MESAU STANDARD; PRT; 155 AA.  
 AC P34004;  
 DT 01-FEB-1994 (Rel. 28, Created)  
 DT 01-FEB-1994 (Rel. 28, Last sequence update)  
 DT 15-JUL-1999 (Rel. 38, Last annotation update)  
 DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF).  
 DE GROWTH FACTOR) (AFGF).  
 GN FGF1 OR FGF-1.  
 OS Mesocricetus auratus (Golden hamster).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Cricetinae;  
 OC Mesocricetus.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 90270291.  
 RA Hall J.A., Harris M.A., Malark M., Mansson P.E., Zhou H., Harris S.E.;  
 RT "Characterization of the hamster DDT-1 cell aFGF/HBGF-1 gene and cDNA and its modulation by steroids.";  
 RT J. Cell. Biochem. 43:17-26(1990).  
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.  
 CC -!- SUBUNIT: MONOMER.  
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY THAN DOES BFGF.  
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
 CC PIR; A60721; A60721.  
 DR HSP; P05230; 2AXM.  
 DR PFAM; PF00167; FGF; 1.  
 DR PRINTS; PR00262; IL1HBGF.  
 DR PRINTS; PR00263; HBGF.  
 DR PROSITE; PS00247; HBGF\_FGF; 1.  
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
 FT PROPEP 1 15 BY SIMILARITY.  
 FT CHAIN 16 155 HEPARIN-BINDING GROWTH FACTOR 1.  
 FT BINDING 24 28 HEPARIN (POTENTIAL).  
 FT BINDING 113 116 HEPARIN (POTENTIAL).  
 SQ SEQUENCE 155 AA; 17403 MW; 4185EC760E412CC5 CRC64;

Query Match 63.5%; Score 967; DB 1; Length 155;  
 Best Local Similarity 97.0%; Pred. No. 5.53e-215;  
 Matches 131; Conservative 2; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKKKLLYCSNGGHFLRLPDGTGTRDSQHQIQLSASGEVYIKSTETGQYL 80  
 QY :|||||  
 76 ANYKKKLLYCSNGGHFLRLPDGTGTRDSQHQIQLSASGEVYIKSTETGQYL 135  
 :|||||  
 Db 81 AMDTGLLYGSQTPNECEFLERLEENHNNTYISKHAENWVGLKKNCKRGPRTHY 140  
 QY :|||||  
 136 AMDTGLLYGSQTPNECEFLERLEENHNNTYISKHAENWVGLKKNCKRGPRTHY 195  
 :|||||  
 Db 141 GQKAILFLPLPVSSD 155  
 QY :|||||  
 196 GQKAILFLPLPVSSD 210  
 :|||||

RESULT 3  
 ID FGF1\_MOUSE STANDARD; PRT; 155 AA.  
 AC P10935;  
 DT 01-JUL-1989 (Rel. 11, Created)  
 DT 01-JUL-1989 (Rel. 11, Last sequence update)  
 DT 15-JUL-1999 (Rel. 38, Last annotation update)  
 DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF).  
 GN FGF1 OR FGF-1 OR FGFA.  
 OS Mus musculus (Mouse).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RC SPECIES-RAT;  
 RX MEDLINE; 89240051.  
 RA Goodrich S., Yan G.C., Bahrenburg K., Mansson P.E.;  
 RT "The nucleotide sequence of rat heparin binding growth factor 1 (HBGF-1).";  
 RT Nucleic Acids Res. 17:2867-2867(1989).  
 RN [2]  
 RP SEQUENCE FROM N.A.  
 RC SPECIES-MOUSE;  
 RX MEDLINE; 90201563.  
 RA Hebert J.M., Basillco C., Goldfarb M., Haub O., Martin J.R.;  
 RT "Isolation of cDNAs encoding four mouse FGF family members and characterization of their expression patterns during embryogenesis.";  
 RT Dev. Biol. 138:454-463(1990).  
 RN [3]  
 RP SEQUENCE FROM N.A.  
 RC SPECIES-MOUSE;  
 RX MEDLINE; 97128312.  
 RA Madial F., Hackshaw K.V., Chiu I.M.;  
 RT "Cloning and characterization of the mouse Fgf-1 gene.";  
 RT Gene 179:231-236(1996).  
 RN [4]  
 RP SEQUENCE FROM N.A.  
 RC SPECIES-MOUSE; STRAIN-BALB/C;  
 RX MEDLINE; 97094746.  
 RA Alam K.Y., Frostholm A., Hackshaw K.V., Evans J.E., Fother A., Chiu I.M.;  
 RT "Characterization of the 1B promoter of fibroblast growth factor 1 and its expression in the adult and developing mouse brain.";  
 RL J. Biol. Chem. 271:30263-30271(1996).  
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.  
 CC -!- SUBUNIT: MONOMER.  
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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 CC -----  
 DR EMBL; X14232; CAA32448.1; -;  
 DR EMBL; M30641; AAA37618.1; -;  
 DR EMBL; U36459; AAC52969.1; -;  
 DR EMBL; U36457; AAC52969.1; JOINED.  
 DR EMBL; U36458; AAC52969.1; JOINED.  
 DR EMBL; U67610; AAC52907.1; -;  
 DR PIR; S04147; S04147.  
 DR PIR; D37360; D37360.  
 DR HSSP; P05230; 2AXM.  
 DR MGD; MGI:95515; FGF1.  
 DR PFAM; PF00167; FGF; 1.  
 DR PRINTS; PR00262; IL1HBGF.





DR	PIR; A25043; A25043.
DR	PIR; B25043; B25043.
DR	PIR; C25043; C25043.
DR	PIR; A2477; A2477.
DR	PIR; B24663; B24663.
DR	PIR; S02102; S02102.
DR	PDB; IBAR; 31-OCT-93.
DR	PDB; IAFK; 31-OCT-93.
DR	PFAM; PF00167; FGF; 1.
DR	PRINTS; PR00262; IL1HBGF.
DR	PROSITE; PS00263; HBGFGF.
DR	PROSITE; PS00247; HBGF_FGF; 1.
KW	Growth factor; Mitogen; Vascularization; Heparin-binding; Acetylation;
KW	3D-structure.
FT	PROPEP 1 15
FT	CHAIN 2 155
FT	CHAIN 16 155
FT	CHAIN 22 155
FT	MOD_RES 2 2
FT	BINDING 24 28
FT	BINDING 113 116
FT	STRAND 27 31
FT	TURN 32 34
FT	TURN 37 40
FT	TURN 42 43
FT	STRAND 46 49
FT	HELIX 55 57
FT	STRAND 59 61
FT	STRAND 69 69
FT	STRAND 71 73
FT	STRAND 79 82
FT	TURN 84 85
FT	STRAND 87 91
FT	HELIX 96 98
FT	STRAND 100 100
FT	STRAND 103 104
FT	TURN 106 107
FT	STRAND 110 111
FT	STRAND 113 114
FT	TURN 116 121
FT	STRAND 123 123
FT	STRAND 126 126
FT	TURN 128 129
FT	STRAND 132 132
FT	STRAND 134 134
FT	HELIX 135 137
FT	TURN 140 141
FT	TURN 144 145
FT	STRAND 147 150
SQ	SEQUENCE 155 AA; 17493 MW; F636641F189F9BFD CRC64;
Query Match 60.2%; Score 917; DB 1; Length 155;	
Best Local Similarity 91.9%; Pred. No. 8.84e-202;	
Matches 124; Conservative 6; Mismatches 5; Indels 0; Gaps	
Db	21 GNKKPKLYCSNGGYFLRLPDGTVDGTRKDSRDQHILQLCAESIGEVYIKSTETGQFL 80 :     :     :     :     :     :     :     :     :     :
Qy	76 ANYKKPKLYCSNGGHFLRLPDGTVDGTRSDRHILQLSAESVGEVIKSTETGQYL 135 :     :     :     :     :     :     :     :     :     :
Db	81 AMPTDGLLGSQTNPNECLFLERLEENHYNTIYSKKHAEKHFWGLKKNGRSKLGRPTHF 140 :     :     :     :     :     :     :     :     :     :
Qy	136 AMDTDGLLGSQTNPNECLFLERLEENHYNTIYSKKHAEKNFVGLKKNGSCCKPGPRTHY 195 :     :     :     :     :     :     :     :     :     :
Db	141 GQXAILFLPLPVSSD 155 :     :     :     :     :     :     :     :     :     :
Qy	196 GQXAILFLPLPVSSD 210 :     :     :     :     :     :     :     :     :     :
RESULT	6
ID	FGF1_CHICK STANDARD; PRT; 155 AA.
AC	P19596;
DT	01-FEB-1991 (Rel. 17, Created)
DD	01-FEB-1996 (Rel. 33, Last sequence update)



[illegible][illegible]

RESULT	9			
ID	FGF2_CHICK	STANDARD;	PRT;	158 AA.
AC	P48800;			
DT	01-FEB-1996	(Rel. 33, Created)		
DT	01-FEB-1996	(Rel. 33, Last sequence update)		
DT	01-FEB-1996	(Rel. 33, Last annotation update)		
DE	HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST			
DE	GROWTH FACTOR) (BFGF).			
GN	FGF2 OR FGF-2.			
OS	Gallus gallus (Chicken).			
OC	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;			
OC	Actinoptera; Aves; Neognathae; Galliformes; Phasianidae; Phasianinae;			
OC	Gallus			
CC	Archosauria			

RN  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE: 93246053.  
 RA Borja A.Z., Zeller R., Meijers C.;  
 RT "Expression of alternatively spliced bcrf first coding exons and  
 RT antisense mRNAs during chicken embryogenesis."

Dev. Biol. 157: 110-118(1993).

CC - FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.

CC - SUBUNIT: MONOMER.

CC - MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES AFGE.

CC -I- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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CC -----  
CC EMBL; M95707; AAA48617.1; -  
CC HSSP; P09038; 1BFF.  
DR  
DR PFAM; PF00157; FGF; 1.  
DR  
DR PRINTS; PR00262; IL1HBGF.  
DR  
DR PRINTS; PR00263; HBGF.FGF.  
DR  
DR PROSITE; PS00247; HBGF FGF; 1.  
DR

KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
 FT PROPEP 1 12 BY SIMILARITY.  
 FT CHAIN 13 158 HEPARIN-BINDING GROWTH FACTOR 2.  
 FT BINDING 30 34 HEPARIN (POTENTIAL).  
 FT BINDING 119 122 HEPARIN (POTENTIAL).  
 SQ SEQUENCE 158 AA; 17374 MW; 7869B684C17F1816 CRC64;  
 Query Match 34.3%; Score 522; DB 1; Length 158;  
 Best Local Similarity 54.5%; Pred. No. 3.26e-99;  
 Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;  
 Db 27 GHFKDPKRLCYCKNGGFFLRINPDGRVGVREKSDPHIKLQLOAERGVSINQVGSANRFL 86  
 QY 76 ANYKKPKLLYCSNGGHFLRLPDGTGDRDRSDQHIQLQLSAESVGEVIKSTETGQYL 135  
 Db 87 ANKEDGRLLALCAETECFFERLESNNYNTYRSKYS--HYVALKRTGQYKPGKPTGP 144  
 QY 136 AMDTDGLLYGSGTNPNECLFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPRTHY 195  
 Db 145 GOKAILFLPMSAKS 158  
 QY 196 GOKAILFLPVS 209

RESULT 10  
 ID FGF2\_SHEEP STANDARD; PRT; 155 AA.  
 AC P20003;  
 DT 01-FEB-1991 (Rel. 17, Created)  
 DT 01-FEB-1996 (Rel. 33, Last sequence update)  
 DT 01-FEB-1996 (Rel. 33, Last annotation update)  
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF) (PROSTATROPIN).  
 GN FGF2 OR FGF-2  
 OS Ovis aries (Sheep).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;  
 OC Bovidae; Caprinae; Ovis.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RA Sutton R., Ward W.G., Raphael K.A., Cam G.R.;  
 RL Submitted (SEP-1994) to the EMBL/GenBank/DBJ databases.  
 RN [2]  
 RP SEQUENCE OF 9-155.  
 RX MEDLINE; 88055577.  
 RA Simpson R.J., Moritz R.L., Lloyd C.J., Fabri L.J., Nice E.C.,  
 RA Rubira M.R., Burgess A.W.;  
 RT "Primary structure of ovine pituitary basic fibroblast growth factor";  
 RL FEBS Lett. 224:128-132(1987).  
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
 CC -!- SUBUNIT: MONOMER.  
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES  
 CC AFGF.  
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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 CC or send an email to [license@isb-sib.ch](mailto:license@isb-sib.ch)).  
 CC  
 CC EMBL; L36136; AAA31519.1;  
 CC PIR; S00185; S00185.  
 CC HSP; P09038; 1BFF.  
 CC PFAM; PF00167; FGF; 1.  
 CC PRINTS; PR00262; ILLHBGF.  
 CC PRINTS; PR00263; HBGF.FGF.  
 CC PROSITE; PS00247; HBGF\_FGF; 1.

KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
 FT PROPEP 1 9  
 FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.  
 FT SITE 45 48 CELL ATTACHMENT SITE (POTENTIAL).  
 FT SITE 87 90 CELL ATTACHMENT SITE (POTENTIAL).  
 FT BINDING 27 31 HEPARIN (POTENTIAL).  
 FT BINDING 116 119 HEPARIN (POTENTIAL).  
 SQ SEQUENCE 155 AA; 17280 MW; B5F2364BA610606D CRC64;  
 Query Match 33.9%; Score 516; DB 1; Length 155;  
 Best Local Similarity 55.2%; Pred. No. 1.08e-97;  
 Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;  
 Db 24 GHFKDPKRLCYCKNGGFFLRINPDGRVGVREKSDPHIKLQLOAERGVSINQVGSANRFL 83  
 QY 76 ANYKKPKLLYCSNGGHFLRLPDGTGDRDRSDQHIQLQLSAESVGEVIKSTETGQYL 135  
 Db 84 AMKEDGRLLALCAETECFFERLESNNYNTYRSKYS--SWYVALKRTGQYKPGKPTGP 141  
 QY 136 AMDTDGLLYGSGTNPNECLFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPRTHY 195  
 Db 142 GOKAILFLPMSAKS 155  
 QY 196 GOKAILFLPVS 209

RESULT 11  
 ID FGF2\_BOVIN STANDARD; PRT; 155 AA.  
 AC P03969;  
 DT 23-OCT-1986 (Rel. 02, Created)  
 DT 23-OCT-1986 (Rel. 02, Last sequence update)  
 DT 01-FEB-1996 (Rel. 33, Last annotation update)  
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF) (PROSTATROPIN) [CONTAINS: KIDNEY-DERIVED GROWTH FACTOR].  
 GN FGF2 OR FGF-2.  
 OS Bos taurus (Bovine).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;  
 OC Bovidae; Bovinae; Bos.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 86261806.  
 RA Abraham J.A., Mergia A., Whang J.L., Tumolo A., Friedman J.,  
 RA Herlitz K.A., Gospodarowicz D., Fiddes J.C.;  
 RT "Nucleotide sequence of a bovine clone encoding the angiogenic protein, basic fibroblast growth factor";  
 RL Science 233:545-548(1986).  
 RN [2]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 87217066.  
 RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Fiddes J.C.;  
 RT "Human basic fibroblast growth factor: nucleotide sequence, genomic organization, and expression in mammalian cells";  
 RL Cold Spring Harb. Symp. Quant. Biol. 51:657-668(1986).  
 RN [3]  
 RP SEQUENCE OF 10-155.  
 RX MEDLINE; 86016731.  
 RA Esch F., Baird A., Ling N., Ueno N., Hill F., Denoroy L., Klepper R.,  
 RA Gospodarowicz D., Boehlen P., Guillemin R.;  
 RT "Primary structure of bovine pituitary basic fibroblast growth factor (FGF) and comparison with the amino-terminal sequence of bovine brain acidic FGF";  
 RL Proc. Natl. Acad. Sci. U.S.A. 82:6507-6511(1985).  
 RN [4]  
 RP SEQUENCE OF 1-9.  
 RX MEDLINE; 86295737.  
 RA Ueno N., Baird A., Esch F., Ling N., Guillemin R.;  
 RT "Isolation of an amino terminal extended form of basic fibroblast growth factor";  
 RL Biochem. Biophys. Res. Commun. 138:580-588(1986).  
 RN [5]  
 RP SEQUENCE OF 25-41.

RC TISSUE-KIDNEY;  
RX MEDLINE; 86095426.  
RA Baird A., Esch F., Boehlen P., Ling N., Gospodarowicz D.;  
RT "Isolation and partial characterization of an endothelial cell growth  
factor from the bovine kidney: homology with basic fibroblast growth  
factor.";  
RL Regul. Pept. 12:201-213(1985).  
RN [6]  
RP SEQUENCE OF 21-40.  
RC TISSUE-KIDNEY;  
RX MEDLINE; 87119165.  
RA Ueno N., Baird A., Esch F., Shimasaki S., Ling N., Guillemin R.;  
RT "Purification and partial characterization of a mitogenic factor from  
bovine liver: structural homology with basic fibroblast growth  
factor.";  
RL Regul. Pept. 16:135-145(1986).  
RN [7]  
RP X-RAY CRYSTALLOGRAPHY (3.0 ANGSTROMS).  
RX MEDLINE; 91095983.  
RA Zhu X., Komiyama H., Chirino A., Faham S., Fox G.M., Arakawa T.,  
Hsu B.T., Rees D.C.;  
RT "Three-dimensional structures of acidic and basic fibroblast growth  
factors.";  
RL Science 251:90-93(1991).  
CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -1- SUBUNIT: MONOMER.  
CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES  
AFGF.  
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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CC -----  
EMBL; M13440; AAA30518.1; -  
PIR; A24663; GRBOB.  
DR PIR; A24819; A24819.  
DR PIR; A32878; A32878.  
DR PDB; 1BAS; 31-OCT-93.  
DR PRAM; PF00167; FGF; 1.  
DR PRINTS; PR00262; ILLHGF.  
DR PROSITE; PS00263; HGF\_FGF; 1.  
DR Growth factor; Mitogen; Vascularization; Heparin-binding;  
3D-structure.  
KW PROPEP 1 9  
FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.  
FT CHAIN 25 155 KIDNEY-DERIVED GROWTH FACTOR.  
FT SITE 46 48 CELL ATTACHMENT SITE (POTENTIAL).  
FT SITE 88 90 CELL ATTACHMENT SITE (POTENTIAL).  
FT BINDING 27 31 HEPARIN (POTENTIAL).  
FT BINDING 116 119 HEPARIN (POTENTIAL).  
FT STRAND 30 34  
FT TURN 35 38  
FT STRAND 39 43  
FT TURN 45 46  
FT STRAND 49 52  
FT TURN 55 56  
FT TURN 58 60  
FT STRAND 62 68  
FT TURN 69 70  
FT STRAND 71 76  
FT TURN 77 80  
FT STRAND 81 85  
FT TURN 87 88  
FT STRAND 91 94

FT HELIX 99 101  
FT STRAND 103 107  
FT TURN 109 110  
FT STRAND 113 117  
FT TURN 121 122  
FT STRAND 124 124  
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FT STRAND 133 133  
FT HELIX 136 138  
FT TURN 141 142  
FT HELIX 144 146  
FT STRAND 149 151  
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Query Match 33.9%; Score 516; DB 1; Length 155;  
Best Local Similarity 55.2%; Pred. No. 1.08e-97;  
Matches 74; Conservative 22; Mismatches 36; Indels 2; Gaps 1;  
  
Db 24 GHFKDPKRLKCKNGGFFLRHDPGRVGVREKSDPHIKLQQAEEGVVSVKGVCANRYL 83  
QY :::: ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| :||  
76 ANYKPKLLKLYCSNGGHFLRLPDGTVGTRDSQDHIQLQLSAESVGEVYIKSTFTGQYL 135  
Db 84 AKKEDGRLLASCKVTDCEFFERLESNNYRYSKYS--SWYALKRTGYKGLKPTGP 141  
QY || ||| :||| :||| :||| :||| :||| :||| :||| :||| :|||  
136 AMDTDGLLYGSGTQPNEECLFLERLEENHYNTYISKHAEKNWFLGKNGSKCKRPRTHY 195  
Db 142 GOKAILFLPMSAKS 155  
QY ||||| ||||| :|||  
196 GOKAILFLPLPVSS 209  
  
RESULT 12  
ID FGF2 MOUSE STANDARD; PRT; 154 AA.  
AC P15655;  
DT 01-APR-1990 (Rel. 14, Created)  
DT 01-APR-1990 (Rel. 14, Last sequence update)  
DT 01-FEB-1996 (Rel. 33, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST  
GROWTH FACTOR) (BFGF) (PROSTATROPIN).  
GN FGF2 OR FGF-2.  
OS Mus musculus (Mouse).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Mammalia; Euthera; Rodentia; Sciurognathi; Muridae; Murinae; Mus.  
RN [1]  
RP SEQUENCE FROM N.A.  
RX MEDLINE; 90201563.  
RA Hebert J.M., Basilico C., Goldfarb M., Haub O., Martin G.R.;  
RT "Isolation of cDNAs encoding four mouse FGF family members and  
characterization of their expression patterns during embryogenesis.";  
RL Dev. Biol. 138:454-463(1990).  
CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -1- SUBUNIT: MONOMER.  
CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES  
AFGF.  
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
CC -----  
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CC -----  
EMBL; M30644; AAA37621.1; -  
DR PIR; C37360; C37360.  
DR HSP; P09038; 1BFF.  
DR MGD; MGI:95516; FGF2.  
DR PFAM; PF00167; FGF; 1.

DR PRINTS; PR00262; IL1HBGF.  
DR PRINTS; PR00263; HBGFEGF.  
DR PROSITE; PS00247; HBGF\_FGF; 1.  
KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
FT PROPEP 1 9  
FT CHAIN 10 154 HEPARIN-BINDING GROWTH FACTOR 2.  
FT BINDING 26 30 HEPARIN (POTENTIAL).  
FT BINDING 115 118 HEPARIN (POTENTIAL).  
SQ SEQUENCE 154 AA; 17153 MW; 689F677416274386 CRC64;  
  
Query Match 33.4%; Score 508; DB 1; Length 154;  
Best Local Similarity 54.5%; Pred. No. 1.15e-95;  
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;  
  
Db 23 GHFKDPKRLKCYNGGFFLRHDPGRVDGVREKSDPHVKLQQAERGVSIVKGVCANRYL 82  
QY 76 ANYKKPKLLKCYNGGFFLRHDPGRVDGVREKSDPHVKLQQAERGVSIVKGVCANRYL 135  
DB 83 AMKEDGRLLASCKVTECEFFERLESNNYTSRKYSSWYVALKRTGYKLGSKTGP 140  
Y 136 AMDTGLLYGSGTPNECLFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 195  
DB 141 GOKAILFLPMSAKS 154  
QY 196 GOKAILFLPLPVSS 209  
  
RESULT 13  
ID FGF2\_RAT STANDARD; PRT; 154 AA.  
AC P13109;  
DT 01-JAN-1990 (Rel. 13, Created)  
DT 01-JAN-1990 (Rel. 13, Last sequence update)  
DT 15-JUL-1998 (Rel. 36, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST  
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).  
GN FGF2 OR FGF-2.  
OS Rattus norvegicus (Rat).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Rodentia; Sclurognathi; Muridae; Murinae; Rattus.  
RN [1]  
RP SEQUENCE FROM N.A.  
RC STRAIN-SPRAGUE-DAWLEY; TISSUE-OVARY;  
RX MEDLINE; 89061721.  
RA Shinasaki S., Emoto N., Koba A., Mercado M., Shibata F.,  
RA Cooksey K., Baird A., Ling N.;  
RT "Complementary DNA cloning and sequencing of rat ovarian basic  
RT fibroblast growth factor and tissue distribution study of its mRNA.";  
RL Biochem. Biophys. Res. Commun. 157:256-263(1988).  
RN [2]  
RP SEQUENCE FROM N.A.  
RC TISSUE-BRAIN;  
RX MEDLINE; 88262516.  
RA Kurokawa T., Seno M., Igarashi K.;  
RT "Nucleotide sequence of rat basic fibroblast growth factor cDNA.";  
RL Nucleic Acids Res. 16:5201-5201(1988).  
RN [3]  
RP SEQUENCE OF 1-28 FROM N.A.  
RC STRAIN-SPRAGUE-DAWLEY; TISSUE-TESTIS;  
RX MEDLINE; 97200905.  
RA Pasumathi K.B.S., Jin Y., Cattini P.A.;  
RT "Cloning of the rat fibroblast growth factor-2 promoter region and  
RT its response to mitogenic stimuli in glioma C6 cells.";  
RL J. Neurochem. 68:898-908(1997).  
RN [4]  
RP SEQUENCE OF 35-154 FROM N.A.  
RC STRAIN-SPRAGUE-DAWLEY; TISSUE-BRAIN;  
RX MEDLINE; 92329546.  
RA El-Husseini A.E.D., Paterson J.A., Mval Y., Shiu R.P.C.;  
RT "PCR detection of the rat brain basic fibroblast growth factor (bFGF)  
RT mRNA containing a unique 3' untranslated region.";  
RL Biochim. Biophys. Acta 1131:314-316(1992).  
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN

VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
CONCENTRATION OF THESE 2 GROWTH FACTORS.  
-!- SUBUNIT: MONOMER.  
-!- TISSUE SPECIFICITY: FOUND IN ALL THE TISSUES EXAMINED.  
-!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES  
AFGF.  
-!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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CC EMBL; M22427; AAA41210.1; -  
DR EMBL; X07285; CAA30265.1; -  
DR EMBL; U78079; AAC53225.1; -  
DR EMBL; X61697; CAA43863.1; -  
DR PIR; S00876; S00876.  
DR PIR; A31674; A31674.  
DR HSP; P09038; 1BFF.  
DR PFAM; PF00167; FGF\_1.  
DR PRINTS; PR00262; IL1HBGF.  
DR PRINTS; PR00263; HBGFEGF.  
DR PROSITE; PS00247; HBGF\_FGF; 1.  
KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
FT PROPEP 1 9  
FT CHAIN 10 154 HEPARIN-BINDING GROWTH FACTOR 2.  
FT BINDING 26 30 HEPARIN (POTENTIAL).  
FT BINDING 115 118 HEPARIN (POTENTIAL).  
SQ SEQUENCE 154 AA; 17139 MW; 1A0F14FF423D8403 CRC64;  
  
Query Match 33.4%; Score 508; DB 1; Length 154;  
Best Local Similarity 54.5%; Pred. No. 1.15e-95;  
Matches 73; Conservative 23; Mismatches 36; Indels 2; Gaps 1;  
  
Db 23 GHFKDPKRLKCYNGGFFLRHDPGRVDGVREKSDPHVKLQQAERGVSIVKGVCANRYL 82  
QY 76 ANYKKPKLLKCYNGGFFLRHDPGRVDGVREKSDPHVKLQQAERGVSIVKGVCANRYL 135  
DB 83 AMKEDGRLLASCKVTECEFFERLESNNYTSRKYSSWYVALKRTGYKLGSKTGP 140  
QY 136 AMDTGLLYGSGTPNECLFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPRTHY 195  
DB 141 GOKAILFLPMSAKS 154  
QY 196 GOKAILFLPLPVSS 209  
  
RESULT 14  
ID FGF2\_HUMAN STANDARD; PRT; 155 AA.  
AC P09038;  
DT 01-NOV-1988 (Rel. 09, Created)  
DT 01-NOV-1988 (Rel. 09, Last sequence update)  
DT 01-NOV-1997 (Rel. 35, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST  
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).  
GN FGF2 OR FGF.  
OS Homo sapiens (Human).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.  
RN [1]  
RP SEQUENCE FROM N.A.  
RC STRAIN-SPRAGUE-DAWLEY; TISSUE-BRAIN;  
RX MEDLINE; 87053817.  
RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Friedman J.,  
RA Gospodarowicz D., Fiddes J.C.;  
RT "Human basic fibroblast growth factor: nucleotide sequence and  
RT genomic organization.";  
RL EMBO J. 5:2523-2528(1986).  
RN [2]  
RP SEQUENCE FROM N.A.

RX MEDLINE; 87217066.  
 RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Fiddes J.C.;  
 RT "Human basic fibroblast growth factor: nucleotide sequence, genomic  
 RL organization, and expression in mammalian cells."  
 RN Cold Spring Harb. Symp. Quant. Biol. 51:657-668(1986).  
 [3]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 87213238.  
 RA Sommer A., Brewer M.T., Thompson R.C., Moscatelli D., Presta M.,  
 RA Rifkin D.B.;  
 RT "A form of human basic fibroblast growth factor with an extended  
 RT amino terminus";  
 RL Biochem. Biophys. Res. Commun. 144:543-550(1987).  
 [4]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 87162468.  
 RA Kurokawa T., Sasada R., Iwane M., Igarashi K.;  
 RT "Cloning and expression of cDNA encoding human basic fibroblast  
 RT growth factor";  
 RL FEBS Lett. 213:189-194(1987).  
 [5]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 89184522.  
 RA Prats H., Kaghad M., Prats A.C., Klagsbrun M., Lelias J.M.,  
 RA Liauzun P., Chalou P., Tauber J.P., Amalric F., Smith J.A.,  
 RA Caput D.;  
 RT "High molecular mass forms of basic fibroblast growth factor are  
 RT initiated by alternative CUG codons";  
 RL Proc. Natl. Acad. Sci. U.S.A. 86:1836-1840(1989).  
 [6]  
 RP SEQUENCE OF 10-35.  
 RX MEDLINE; 86275260.  
 RA Gautschi P., Frater-Schroeder M., Boehlen P.;  
 RT "Partial molecular characterization of endothelial cell mitogens from  
 RT human brain: acidic and basic fibroblast growth factors";  
 RL FEBS Lett. 204:203-207(1986).  
 [7]  
 RP SEQUENCE OF 10-39.  
 RX MEDLINE; 86186784.  
 RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;  
 RT "Human brain-derived acidic and basic fibroblast growth factors:  
 RT amino terminal sequences and specific mitogenic activities";  
 RL Biochem. Biophys. Res. Commun. 135:541-548(1986).  
 [8]  
 RP SEQUENCE OF 2-22.  
 RX MEDLINE; 87156686.  
 RA Story M.T., Esch F., Shimasaki S., Sasse J., Jacobs S.C., Lawson R.K.;  
 RT "Amino-terminal sequence of a large form of basic fibroblast growth  
 RT factor isolated from human benign prostatic hyperplastic tissue";  
 RL Biochem. Biophys. Res. Commun. 142:702-709(1987).  
 [9]  
 RP X-RAY CRYSTALLOGRAPHY (2.2 ANGSTROMS).  
 RX MEDLINE; 91195367.  
 RA Eriksson A.E., Cousens L.S., Weaver L.H., Matthews B.W.;  
 RT "Three-dimensional structure of human basic fibroblast growth  
 RT factor";  
 RL Proc. Natl. Acad. Sci. U.S.A. 88:3441-3445(1991).  
 [10]  
 RP X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).  
 RX MEDLINE; 94004464.  
 RA Eriksson A.E., Cousens L.S., Matthews B.W.;  
 RT "Refinement of the structure of human basic fibroblast growth factor  
 RT at 1.6-A resolution and analysis of presumed heparin binding sites by  
 RT selenate substitution";  
 RL Protein Sci. 2:1274-1284(1993).  
 [11]  
 RP X-RAY CRYSTALLOGRAPHY (1.8 ANGSTROMS).  
 RX MEDLINE; 91195368.  
 RA Zhang J., Cousens L.S., Barr P.J., Sprang S.R.;  
 RT "Three-dimensional structure of human basic fibroblast growth factor,  
 RT a structural homolog of interleukin 1 beta";  
 RL Proc. Natl. Acad. Sci. U.S.A. 88:3446-3451(1991).  
 [12]

RP X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).  
 RX MEDLINE; 92121151.  
 RA AGO H., Kitagawa Y., Fujishima A., Matsuura Y., Katsube Y.;  
 RT "Crystal structure of basic fibroblast growth factor at 1.6-A  
 RT resolution";  
 RL J. Biochem. 110:360-363(1991).  
 [13]  
 RP X-RAY CRYSTALLOGRAPHY (2.8 ANGSTROMS).  
 RX MEDLINE; 91095983.  
 RA Zhu X., Komiya H., Chirino A., Faham S., Fox G.M., Arakawa T.,  
 RA Hsu B.T., Rees D.C.;  
 RT "Three-dimensional structures of acidic and basic fibroblast growth  
 RT factors";  
 RL Science 251:90-93(1991).  
 [14]  
 RP STRUCTURE BY NMR.  
 RX MEDLINE; 97040521.  
 RA Moy F.J., Seddon A.P., Boehlen P., Powers R.;  
 RT "High-resolution solution structure of basic fibroblast growth factor  
 RT determined by multidimensional heteronuclear magnetic resonance  
 RT spectroscopy";  
 RL Biochemistry 35:13552-13561(1996).  
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
 CC -!- SUBUNIT: MONOMER.  
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES  
 CC AFGF.  
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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 CC -----  
 DR EMBL; M17599; AA52534.1; ALT\_INIT.  
 DR EMBL; X04431; CA28027.1; -.  
 DR EMBL; X04432; CA28028.1; -.  
 DR EMBL; X04433; CA28029.1; -.  
 DR EMBL; M27968; AA52448.1; -.  
 DR EMBL; J04513; AA52533.1; ALT\_INIT.  
 DR PIR; A25824; A25824.  
 DR PIR; A26642; A26642.  
 DR PIR; B24243; B24243.  
 DR PIR; B24301; B24301.  
 DR PIR; B32878; B32878.  
 DR PIR; S00297; S00297.  
 DR PDB; 2FGF; 15-APR-92.  
 DR PDB; 4FGF; 15-JUL-93.  
 DR PDB; 1FGA; 15-JUL-93.  
 DR PDB; 1BFB; 03-APR-96.  
 DR PDB; 1BFC; 03-APR-96.  
 DR PDB; 1BFF; 16-JUN-97.  
 DR PDB; 2BFH; 30-APR-94.  
 DR PDB; 1BLA; 08-NOV-96.  
 DR PDB; 1BLD; 08-NOV-96.  
 DR MIM; 134920; -.  
 DR PFAM; PF00167; FGF; 1.  
 DR PRINTS; PR00262; ILIHGFG.  
 DR PRINTS; PR00263; HBGF.FGF.  
 DR PROSITE; PS00247; HBGF.FGF; 1.  
 KW Growth factor; Mitogen; Vascularization; Heparin-binding;  
 KW 3D-structure.  
 FT PROPEP 1 9  
 FT CHAIN 10 155  
 FT SITE 46 48  
 FT SITE 88 90  
 FT BINDING 27 31  
 HEPARIN-BINDING GROWTH FACTOR 2.  
 CELL ATTACHMENT SITE (POTENTIAL).  
 CELL ATTACHMENT SITE (POTENTIAL).  
 HEPARIN (POTENTIAL).





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(TM)

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mpsrch_pp protein - protein database search, using Smith-Waterman algorithm
Run on: Tue Aug 29 16:10:45 2000; MasPar time 18.71 Seconds
778.223 Million cell updates/sec
bular output not generated.

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Title: >US-09-121-017B-27
Description: (1-210) from US09121017B.pep
Perfect Score: 1522
Sequence: 1 MSRGAGRVOGTLOALVELGV.....

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1 MSRGAGRVOGTLOALVFLGV.....PRTHYGOKAILFLPLPVSSD 210

Scoring table: PAM 150  
Gap 11

Searched: 225878 seqs, 69334122 residues

Post-processing: Minimum Match 08

Database: sptrembl12

1:sp\_archaea 2:sp\_bacteria 3:sp\_fungi 4:sp\_human  
5:sp\_invertebrate 6:sp\_mammal 7:sp\_mhc 8:sp\_organelle  
9:sp\_phage 10:sp\_plant 11:sp\_rodent 12:sp\_unclassified  
13:sp\_vertebrate 14:sp\_virus

**Statistics:** Mean 44.219; Variance 70.528; scale 0.627

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

## SUMMARIES

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		Match	Score					
1	511	33	6	130	6	O77767	BASIC FIBROBLAST GROWTH	3.73e-95
2	509	33	4	196	4	P78443	21 <del>NO-BASIC</del> FIBROBLAST	1.18e-94
3	441	29	0	206	13	Q9YGDB	FIBROBLAST GROWTH FACT	8.49e-78
4	382	25	1	101	13	P79706	BASIC FGF (FRAGMENT)	2.16e-63
5	346	22	7	146	13	P707659	FIBROBLAST GROWTH FACT	9.85e-55
6	336	22	1	196	13	Q9YH31	PUTATIVE FIBROBLAST GR	2.39e-52
7	313	20	6	115	11	O60487	BASIC FIBROBLAST GROWTH	6.64e-47
8	301	19	8	194	6	P79150	KERATINOCYTE GROWTH FA	4.35e-44
9	296	19	4	212	13	O42407	FIBROBLAST GROWTH FACT	6.41e-43
10	274	18	0	252	11	Q89096	FHF-4B.	8.07e-38
11	265	17	3	60	4	Q16588	ACIDIC FIBROBLAST GROW	9.39e-36
12	264	17	4	59	4	Q16089	ACIDIC FIBROBLAST GROW	1.59e-35
13	264	17	3	70	11	O54837	FIBROBLAST GROWTH FACT	1.59e-35
14	257	16	9	243	13	Q9W6A1	FIBROBLAST GROWTH FACT	6.28e-34
15	251	16	5	137	4	Q99517	FIBROBLAST GROWTH FACT	1.44e-32
16	248	16	3	192	4	O95830	FIBROBLAST GROWTH FACT	6.88e-32
17	248	16	3	245	13	Q9W6A2	FIBROBLAST GROWTH FACT	6.88e-32
18	236	15	5	200	13	P79925	FIBROBLAST GROWTH FACT	6.42e-29
19	225	14	8	74	6	O77561	KERATINOCYTE GROWTH FA	9.55e-27
20	226	14	8	425	5	O76831	LET-756 PROTEIN.	5.74e-27

Accession	Length	Accession	Length	Accession	Length	Accession	Length
226	14.8	425	5	076831	5.74e-27	LET-756	PROTEIN.

## ALIGNMENTS

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AC          077767;
AD          01-NOV-1998 (TReMBLrel. 08, Created)
DT          01-NOV-1998 (TReMBLrel. 08, Last sequence update)
DT          01-NOV-1999 (TReMBLrel. 12, Last annotation update)
DE          BASIC FIBROBLAST GROWTH FACTOR (FRAGMENT).
GN          BFGF.
OS          Canis familiaris (Dog).
OC          Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC          Eutheria; Carnivora; Fissipedia; Canidae; Canis.
RN          [1]
RC          SEQUENCE FROM N.A.
RC          TISSUE=ADRENAL GLAND;
RA          TROCHTA O.A., JACOBS R.M., LAMARRE J.;
RA          "The role bFGF in canine Hemangiosarcoma.";
RRL         Submitted (APR-1998) to the EMBL/GenBank/DDBJ databases.
DR          EMBL; AF060362; AAC35912.1; -.
DR          HSPB; P09038; IBFF.
DR          PROSITE; PS00247; HBGF_FGF; 1.
DR          PFAM; PF00167; FGF; 1.
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FT          NON_TER 130 130
SQ          SEQUENCE 130 AA; 14902 MW; D86A90AA CRC32;

Query Match 33.6%; Score 511; DB 6; Length 130;
Best Local Similarity 55.3%; Pred.No. 3.73e-95;
Matches 73; Conservative 21; Mismatches 36; Indels 2; Gaps 1;

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Qy         78 YKKPKLLXCNGGHFLRILPDGTVDGRDSQHQLQLSAESGEVIKSTFCGYLAM 137
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Ddb        61 KEDGRLLASKVTDSCFFTERLESNNYNTYSRKYS--SWYVALKRTGOYKLGPKTGPGQ 118
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Qy        138 DTDGLLYGSOTPNESCLEFLERLEENHYNTYISKHAENWFVLGKKNCKSGKRGPRTHYGQ 197
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Ddb        119 KAILFLPWSAKS 130
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Qy        198 KAILFLPLPVSS 209
           |||:|||:|||:|||:|||:|||:|||:|||:|||:|||:|||:|||:|||:|||

RESULT     2
ID          P78443 PRELIMINARY; PRT; 196 AA.

```

ID P78443



OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;  
 OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.

RN [1]  
 RX SEQUENCE FROM N.A.  
 RA MEDLINE: 93246053.  
 RA BORJA A.Z., ZELLER R., MEIJERS C.;  
 RT "Expression of alternatively spliced bFGF first coding exons and  
 antisense mRNAs during chicken embryogenesis.";  
 RL Dev. Biol. 157:110-118(1993).  
 RN [2]  
 RP SEQUENCE OF 52-85 FROM N.A.  
 RX MEDLINE: 90382254.  
 RA MITRANI E., GROENBAUM Y., SHOHAT H., ZIV T.;  
 RT "Fibroblast growth factor during mesoderm induction in the early chick  
 embryo.";  
 RL Development 109:387-393(1990).  
 DR EMBL: M95706; AAA48616.1; -;  
 DR EMBL: X56804; CAA40139.1; -;  
 DR HSSP: P09038; 2BFH.  
 DR PROSITE: PS00247; HBGF\_FGF; 1.  
 DR PFAM: PF00167; FGF; 1.  
 DR PRINTS: PR00262; IL1HBGF.  
 SQ SEQUENCE 146 AA; 16182 MW; 44C5274B CRC32;

Query Match 22.7%; Score 346; DB 13; Length 146;  
 Best Local Similarity 48.1%; Pred. No. 9.85e-55;  
 Matches 50; Conservative 20; Mismatches 32; Indels 2; Gaps 1;

Db 45 ERYSMVKIQLQAEERGVSVIKGSANFLAKEDGRLLALCATCECFERLESNNYN 104  
 QY 106 DRSDQHIQLQSAESGEYVIKSTETGOYLAMTDGLYGSTPNECLFLERLEENHYN 165  
 Db 105 TYRSRYSD--WVVALKRTGOYKPGKTPGKAILFLPMSAKS 146  
 QY 166 TYISKHAENWFVGLKNGSCARGRTHYQKAILFLPLVSS 209

RESULT 6  
 ID Q9YH31 PRELIMINARY; PRT; 196 AA.  
 AC Q9YH31;  
 DT 01-MAY-1999 (TRENBLrel. 10, Created)  
 DT 01-MAY-1999 (TRENBLrel. 10, Last sequence update)  
 DT 01-NOV-1999 (TRENBLrel. 12, Last annotation update)  
 DE PUTATIVE FIBROBLAST GROWTH FACTOR-4.  
 OS Notoththalmus viridescens (Eastern newt) (Triturus viridescens).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Amphibia;  
 OC Batrachia; Caudata; Salamandridae; Salamandridae; Notoththalmus.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RA WEI Y.;  
 RL "Putative Newt Fibroblast Growth Factor-4.";  
 RL Submitted (OCT-1996) to the EMBL/GenBank/DBJ databases.  
 DR EMBL: U76998; AAC98812.1; -;  
 DR HSSP: P09038; 1BFF.  
 DR PROSITE: PS00247; HBGF\_FGF; 1.  
 SQ SEQUENCE 196 AA; 22033 MW; 455E08A3 CRC32;

Query Match 22.1%; Score 336; DB 13; Length 196;  
 Best Local Similarity 35.2%; Pred. No. 2.39e-52;  
 Matches 69; Conservative 49; Mismatches 65; Indels 13; Gaps 9;

Db 10 ALLPVLLGLSLGLARCLPMPSPNGTL-E-WSWETLYSOSLARLAGGORTDAHYGEVL 67  
 QY 11 TLQALVELGLVGVWVPSAGARANGTLDSRGWGLLSRSRAGLAG-EISGVNWESGL 69  
 Db 68 LGIKRL----R-RL-XCNVIGFHLQVLPDGRIGHMSES-RYSLLISPVVERGVYCMFG 120  
 QY 70 VGIKRQANKKPKLLYCSNGHF-LRLPDGTVDTGTRDSQHIQLQSAESGEYVIK 128  
 Db 121 VQSGFLANMSKRLGKGYFSECFKEMLLPNNTNAYESWYPM--YIALSKNGRAK 178  
 QY 129 TETGOYLAMTDGLYGSTPNECLFLERLEENHYNHYISKHAENWFVGLKNGSCK 188

Db 179 KGNKVSPTMTVTHFLP 194  
 QY 189 RGRPRHYGQKAILFLP 204

RESULT 7  
 ID Q60487 PRELIMINARY; PRT; 115 AA.  
 AC Q60487;  
 DT 01-NOV-1996 (TRENBLrel. 01, Created)  
 DT 01-NOV-1996 (TRENBLrel. 01, Last sequence update)  
 DT 01-NOV-1999 (TRENBLrel. 12, Last annotation update)  
 DE BASIC FIBROBLAST GROWTH FACTOR (FRAGMENT).  
 OS Cavia porcellus (Guinea pig).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
 OC Eutheria; Rodentia; Hystricognathi; Caviidae; Cavia.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RA TISSUE-PROSTATE;  
 RA RICCIARDELLI C.;  
 RL Submitted (JAN-1996) to the EMBL/GenBank/DBJ databases.  
 DR EMBL: L75974; AAA85394.1; -;  
 DR HSSP: P09038; 2BFH.  
 DR PROSITE: PS00247; HBGF\_FGF; 1.  
 DR PFAM: PF00167; FGF; 1.  
 DR NON\_TER 1  
 FT SEQUENCE 115 AA; 13495 MW; 4B12914A CRC32;

Query Match 20.6%; Score 313; DB 11; Length 115;  
 Best Local Similarity 44.6%; Pred. No. 6.64e-47;  
 Matches 45; Conservative 22; Mismatches 31; Indels 3; Gaps 2;  
 Db 1 GFFLRHPDGRVDGVRKTPDHKHNFKPKA-EELCYOGLSNRYLAKMEDGRLLASKCV 59  
 QY 90 GHFLRLPDGTVDTGTRDSQHIQLQSAESGEYVIKSTETGOYLAMTDGLYGSTP 149  
 Db 60 TDECFERLESNNYNTYRSKYS--SWYVALKRTGOYKLG 98  
 QY 150 NEECLFLERLEENHYNTYISKHAENWFVGLKNGSCKRG 190

RESULT 8  
 ID P79150 PRELIMINARY; PRT; 194 AA.  
 AC P79150;  
 DT 01-MAY-1997 (TRENBLrel. 03, Created)  
 DT 01-MAY-1997 (TRENBLrel. 03, Last sequence update)  
 DT 01-NOV-1999 (TRENBLrel. 12, Last annotation update)  
 DE KERATINOCYTE GROWTH FACTOR.  
 OS Canis familiaris (Dog).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
 OC Eutheria; Carnivora; Fissipedia; Canidae; Canis.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RA MEDLINE: 96226403.  
 RA CANATAN H., CHANG W.Y., SUGIMOTO Y., SHIDAIFAT F., KULP S.K.,  
 RA BRUEGGEMEIER R.W., LIN Y.C.;  
 RT "Keratinocyte growth factor (KGF/FGF-7) has a paracrine role in canine  
 prostate: molecular cloning of mRNA encoding canine KGF.";  
 RL DNA Cell Biol. 15:247-254(1996).  
 DR EMBL: U08000; AAB38972.1; -;  
 DR HSSP: P05230; 2AFG.  
 DR PROSITE: PS00247; HBGF\_FGF; 1.  
 DR PFAM: PF00167; FGF; 1.  
 DR PRINTS: PR00262; IL1HBGF.  
 DR PRINTS: PR00263; HBGF\_FGF.  
 SQ SEQUENCE 194 AA; 22476 MW; 2B71A8ED CRC32;

Query Match 19.8%; Score 301; DB 6; Length 194;  
 Best Local Similarity 38.6%; Pred. No. 4.35e-44;  
 Matches 49; Conservative 28; Mismatches 47; Indels 3; Gaps 3;  
 Db 69 LFCRTQ-WYLRDKRKVKGTQEMKNSYNIMEIRVAVGIVAIGKGVSEYILAMNKEGRL 127  
 QY 84 LYCSNGGHLRLPDGTVDTGTRDSQHIQLQSAESGEYVIKSTETGOYLAMTDGL 143

Db 128 YAKKEDNCNKELILENHYNTYASAKWTHSGCMFVALNOKGVPVGRKTKKEOKTAH 187  
 QY 144 YGSDTPNEECLEFLERLENHYNTYIS-K-KHAENWFGVLKNGSKCRGPRTHYGQRAIL 201

Db 188 FLPMAT 194  
 QY 202 FLPLPV 208

RESULT 9 PRELIMINARY; PRT; 212 AA.  
 ID O42407; AC O42407;  
 DT 01-JUN-1998 (TrEMBLrel. 05, Created)  
 DT 01-JUN-1998 (TrEMBLrel. 05, Last sequence update)  
 DT 01-NOV-1999 (TrEMBLrel. 12, Last annotation update)  
 DE FIBROBLAST GROWTH FACTOR 10.  
 OS Gallus gallus (Chicken).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;  
 NC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 97330690.  
 RA OHUCHI H., NAKAGAWA T., YAMAMOTO A., ARAGA A., OHTA T., ISHIMARU Y.,  
 RA YOSHIOKA H., KUWANA T., NOHNO T., YAMASAKI M., ITOH N., NOJI S.;  
 RT "The mesenchymal factor, FGF10, initiates and maintains the outgrowth  
 RT of the chick limb bud through interaction with FGF8, an apical  
 RT ectodermal factor".  
 RL Development 124:2235-2244(1997).  
 DR EMBL; D86333; BAA24945.1; -;  
 DR HSSP; P03968; 1BAR.  
 DR PFAM; PF00167; FGF; 1.  
 DR PRINTS; PR00263; HBGFEGF.  
 SQ SEQUENCE 212 AA; 23631 MW; C8AB1883 CRC32;

Query Match 19.4%; Score 296; DB 13; Length 212;  
 Best Local Similarity 38.7%; Pred. No. 6.41e-43;  
 Matches 53; Conservative 28; Mismatches 52; Indels 4; Gaps 4;

Db 78 QGDVRRKRL-Y-SYNYFLKLEKNGKVGSGTKKNCPSILEITSVEIGVAVAKISNY 135  
 QY 75 QANYKPKLLYCSNGGHFLRLPDGTDGTRDSQHQQLQLSAESVGEYIKSTGTQY 134  
 Db 136 LAMNKGKGVGSKFNSCKLKEIEENGYNTYASLNWKNQGMFVALNGRATKRGOK 195  
 QY 135 LAMTDGLLYGSDTPNEECLEFLERLENHYNTYIS-K-KHAENWFGVLKNGSKCRGPR 192  
 Db 196 TRKNTSAHFLPMVMS 212  
 QY 193 THYGOKAILFLPLPVSS 209

RESULT 10 PRELIMINARY; PRT; 252 AA.  
 ID O89096; AC O89096;  
 DT 01-NOV-1998 (TrEMBLrel. 08, Created)  
 DT 01-NOV-1998 (TrEMBLrel. 08, Last sequence update)  
 DT 01-NOV-1999 (TrEMBLrel. 12, Last annotation update)  
 DE FGF-4B.  
 OS Rattus norvegicus (Rat), and Mus musculus (Mouse).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
 NC Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RX TISSUE-BRAIN;  
 RA YAMAMOTO S., MIKAMI T., OHBAYASHI N., OHTA M., ITOH N.;  
 RT "Structure and expression of a novel isoform of mouse FGF homologous  
 RT factor (FGF)-4".  
 RL Biochim. Biophys. Acta 1398:38-41(1998).  
 DR EMBL; AB008908; BAA31544.1; -;  
 DR EMBL; AB008907; BAA31543.1; -;  
 DR HSSP; P03968; 1BAR.

DR PROSITE; PS00247; HBGF\_FGF; 1.  
 DR PFAM; PF00167; FGF; 1.  
 SQ SEQUENCE 252 AA; 28364 MW; 1DFD5B4B CRC32;  
 Query Match 18.0%; Score 274; DB 11; Length 252;  
 Best Local Similarity 37.5%; Pred. No. 8.07e-38;  
 Matches 48; Conservative 26; Mismatches 49; Indels 5; Gaps 3;

Db 80 LYCRQG-YILOMHPDGLDGTGKDDSTNSILFNLPVGLRVVAIQGVKTGLYIANGEGYL 138  
 QY 84 LYCSNGGHFLRLPDGTDGTRDSQHQQLQLSAESVGEYIKSTGTQYLAAMD7DGLL 143  
 Db 139 YPSELTPECKFKESVFNVIYVSNLYRQESGRAWFLGNKEGOVMKGNVKKTKPA 198  
 QY 144 YGSDTPNEECLEFLERLENHYNTYISK--KHAENWFGVLKNGSKCRGPRTHYGOKA 199  
 Db 199 AHFLPKPL 206  
 QY 200 ILFLPLPV 207

RESULT 11 PRELIMINARY; PRT; 60 AA.  
 ID Q16588; AC Q16588;  
 DT 01-NOV-1996 (TrEMBLrel. 01, Created)  
 DT 01-NOV-1996 (TrEMBLrel. 01, Last sequence update)  
 DT 01-NOV-1999 (TrEMBLrel. 12, Last annotation update)  
 DE ACIDIC FIBROBLAST GROWTH FACTOR (FRAGMENT).  
 OS Homo sapiens (Human).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
 NC Eutheria; Primates; Catarrhini; Hominidae; Homo.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 94069734.  
 RA ZHAO X.M., YEOH T.K., HIEBERT M., FRIST W.H., MILLER G.G.;  
 RT "The expression of acidic fibroblast growth factor (heparin-binding  
 RT growth factor-1) and cytokine genes in human cardiac allografts and T  
 RT cells".  
 RL Transplantation 56:1177-1182(1993).

Query Match 17.4%; Score 265; DB 4; Length 60;  
 Best Local Similarity 92.1%; Pred. No. 9.39e-36;  
 Matches 35; Conservative 2; Mismatches 1; Indels 0; Gaps 0;

Db 21 GNYKKPKLLYCSNGGHFLRLPDGTDGTRDSQHQHTD 58  
 QY 76 ANYKKPKLLYCSNGGHFLRLPDGTDGTRDSQHQHTQ 113

RESULT 12 PRELIMINARY; PRT; 59 AA.  
 ID Q16089; AC Q16089;  
 DT 01-NOV-1996 (TrEMBLrel. 01, Created)  
 DT 01-NOV-1996 (TrEMBLrel. 01, Last sequence update)  
 DT 01-NOV-1999 (TrEMBLrel. 12, Last annotation update)  
 DE ACIDIC FIBROBLAST GROWTH FACTOR (FRAGMENT).  
 OS Homo sapiens (Human).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
 NC Eutheria; Primates; Catarrhini; Hominidae; Homo.

```

DR PROSITE: PS00247; HBGF_FGF; 1.
SQ SEQUENCE 243 AA; 27455 MW; A9E6E8CD CRC32;

Query Match 16.9%; Score 257; DB 13; Length 243;
Best Local Similarity 34.4%; Pred. No. 6,28e-34;
Matches 44; Conservative 31; Mismatches 48; Indels 5; Gaps

Db 77 LF-SQEQYFIQHPDGTIGTDKDNSDYTLFNLPVGLRVAIQGVKAGLYVAMNAEGYL 135
| : | | | : | | | | | : : : | : | : | | : | | : |
QY 84 LYCSNGGHFLRIILPDGTVDGTRSDQHIQLQLSAESVGEVIKSTETGOYLANDTDGLL 143
| : | | | : | | | | | : : : | : | : | | : | | : |

Db 136 YSSDVTTPCKFKESVFENYVYVYSSTLRQOESGRAWFLGLNKKEQIMKGNRVKTKPS 195
| : | : | | | | | : | | | | | : : | : | | | | : | : | :
QY 144 YGSQTNEECFLERLEENHYNTIISK--KHAE--KNWVFGLKKNGCKRGPRTHYGQKA 199
| : | : | | | | | : | | | | | : : | : | | | | : | : | :

Db 196 SHEVPKPI 203
| : | :
QY 200 ILFLPLPV 207

RESULT 15
ID Q99517 PRELIMINARY; PRT: 127 AA.
AC Q99517;
DT 01-MAY-1997 (TrEMBLrel. 03, Created)
DT 01-MAY-1997 (TrEMBLrel. 03, Last sequence update)
DI 01-NOV-1999 (TrEMBLrel. 12, Last annotation update)
DE FIBROBLAST GROWTH FACTOR 12 (FRAGMENT).
GN FGF12.
OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Primates; Catarrhini; Hominidae; Homo.
NC [1]
RN
RP SEQUENCE FROM N.A.
RA COULTER F., PONTAROTTI P., ROUBIN R., HARTUNG H., GOLDFARB M.,
RA BIRNBAUM D.;
RL J. Mol. Evol. 0:0-0(0).
RL EMBL; 2702276; CAA94240.1; -.
RL HSSP; P03968; 1AFC.
DR PROSITE; PS00247; HBGF_FGF; 1.
DR PFAM; PF00167; FGF; 1.
FT NON_TER 1
FT NON_TER 127
SQ SEQUENCE 127 AA; 14478 MW; 10E2842D CRC32;

Query Match 16.5%; Score 251; DB 4; Length 127;
Best Local Similarity 34.5%; Pred. No. 1,44e-32;
Matches 44; Conservative 30; Mismatches 48; Indels 5; Gaps

Db 2 LF-SQEQYFIQHPDGTIGTDKDNSDYTLFNLPVGLRVAIQGVKAGLYVAMNAEGYL 60
| : | | | : | | | | | : : : | : | : | | : | | : |
QY 84 LYCSNGGHFLRIILPDGTVDGTRSDQHIQLQLSAESVGEVIKSTETGOYLANDTDGLL 143
| : | | | : | | | | | : : : | : | : | | : | | : |

Db 61 YSSDVTTPCKFKESVFENYVYVYSSTLRQOESGRAWFLGLNKKEQIMKGNRVKTKPS 120
| : | : | | | | | : | | | | | : : | : | | | | : | : | :
QY 144 YGSQTNEECFLERLEENHYNTIISK--KHAE--KNWVFGLKKNGCKRGPRTHYGQKA 199
| : | : | | | | | : | | | | | : : | : | | | | : | : | :

Db 121 SHEVPKPI 127
| : | :
QY 200 ILFLPLP 206

Search completed: Tue Aug 29 16:11:48 2000
Job time : 63 secs.

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Result No.	Score	Query		Length	DB	ID	Description	Pred. No.
		Match						
1	931	71.9	140	1	R25914	Human acidic fibroblasts	1.80e-82	
2	931	71.9	140	1	R34937	Human acidic fibroblasts	1.80e-82	
3	931	71.9	140	1	P90068	Human acid fibroblast	1.80e-82	
4	931	71.9	140	1	R74647	Human recombinant aFGF	1.80e-82	
5	931	71.9	140	1	R04806	Human acidic fibroblasts	1.80e-82	
6	931	71.9	140	1	P70995	Sequence of human prot	1.80e-82	
7	931	71.9	141	1	R10527	Human acidic fibroblasts	1.80e-82	
8	931	71.9	151	1	R05789	Human aFGF encoded by	1.80e-82	
9	931	71.9	154	1	W92283	Human beta-endothelial	1.80e-82	
10	931	71.9	154	1	W04805	Human beta-endothelial	1.80e-82	
11	931	71.9	154	1	W06816	Human endothelial cell	1.80e-82	
12	931	71.9	154	1	W75414	Human beta-endothelial	1.80e-82	
13	931	71.9	155	1	P94037	Human acidic fibroblasts	1.80e-82	
14	931	71.9	155	1	R70812	FGF-1.	1.80e-82	
15	931	71.9	155	1	P70482	Sequence encoded by co	1.80e-82	
16	931	71.9	155	1	R80776	Fibroblast growth fact	1.80e-82	
17	931	71.9	155	1	W53022	Fibroblast growth fact	1.80e-82	
18	931	71.9	155	1	W75711	Fibroblast growth fact	1.80e-82	
19	931	71.9	155	1	W75415	Human endothelial cell	1.80e-82	
20	931	71.9	155	1	W92291	Human endothelial cell	1.80e-82	
21	931	71.9	165	1	R05785	Human bFGF encoded by	1.80e-82	
22	931	71.9	168	1	W06818	Human endothelial cell	1.80e-82	
23	928	71.7	134	1	W75413	Human alpha-endothelia	3.68e-82	





PN US552528-A.  
PD 03-SEP-1996.  
PF 03-MAR-1986; 835594.  
PR 03-MAR-1986; US-835594.  
PR 18-DEC-1987; US-134499.  
PR 29-APR-1991; US-693079.  
PR 27-NOV-1994; US-799859.  
PR 03-NOV-1994; US-334884.  
PA (RHON ) RHONE POULENC RORER PHARM INC.  
PI Burgess W, Maciag T;  
DR WPI: 96-412132/41.  
DR N-PSDB; T37503.  
PT Isolated, purified, biologically active bovine beta endothelial cell  
PT growth factor - useful to regenerate or treat damaged blood vessels  
PS Disclosure; Fig 8; 28pp; English.  
CC Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having  
CC a mol.wt. of 20 kD can be purified at least 16300 fold from bovine  
CC brain using heparin-Sepharose affinity chromatography. ECGF is  
CC useful for, among other purposes, diagnostic applications and has  
CC potential in the treatment of damaged blood vessels or other  
CC endothelial cell-lined structures.  
CC Human ECGF (T37503) or fragments may be obtained using  
CC oligonucleotides (T37504 and T37508 to T37509) whose design is based  
CC on the sequence of bovine alpha- and beta-ECGF.  
SQ Sequence 140 AA;

Query Match 71.9%; Score 931; DB 1; Length 140;  
Best Local Similarity 94.4%; Pred. No. 1.80e-82;  
Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

Db 3 LPPGNYKKPKLLYCSNGGHLRLPDGTVDRSDQHIQLQLSAESVGEVYIKSTETG 62  
| : |||||  
QY 38 LLDANYKKPKLLYCSNGGHLRLPDGTVDRSDQHIQLQLSAESVGEVYIKSTETG 97  
| : |||||

Db 63 OYLAMDTGLLYGSQTPNEECFLERLEEN-----HYNTYISKKHAENWVGLKKNKNGSC 117  
| : |||||  
QY 98 OYLAMDTGLLYGSQTPNEECFLERLEENATPAPHYNTYISKKHAENWVGLKKNKNGSC 157  
| : |||||

Db 118 KRGRPRTHYGOKAILFLPLPVSSD 140  
| : |||||  
QY 158 KRGRPRTHYGOKAILFLPLPVSSD 180  
| : |||||

RESULT 6  
ID P70995 standard; protein; 140 AA.  
AC P70995;  
DT 13-JUN-1991 (first entry)  
DE Sequence of human proteinaceous factor (PFI) with mitogenic activity.  
DE Cell growth promoter; mitogen; vascularisation; wound healing.  
DE Homo sapiens.  
FT Key Location/Qualifiers  
FT misc\_difference 140 /label= Asp-OH  
FT EP-241136-A.  
PN 14-OCT-1987.  
PF 06-MAR-1987; 301969.  
PR 07-MAR-1986; US-838096.  
PR (HARD ) HARVARD COLLEGE.  
PI Lobb RR, Harper JW, Strydom DJ;  
DR WPI: 87-285995/41.  
DR Mitogenic polypeptide isolated from human brain tissue - useful  
PT for increasing vascular effect in eg wound healing, or  
PT generating endothelial cell linings for vascular prostheses, etc.  
PT Claim 3; Page 1; 31pp; English.  
CC The PF of the invention was obt'd. from human brain tissue. It has a  
CC mol. wt. of 15,200-16,500 (pref. 15,616-16,056) and has a high  
CC affinity for heparin. PFI and fragments are useful for promoting the  
CC growth of mesoderm-derived cells or neuroectoderm-derived cells and  
CC generating endothelial cell linings for vascular prostheses (all  
CC claimed). The polypeptides are useful for increasing vascularisation.  
SQ Sequence 140 AA;

Query Match 71.9%; Score 931; DB 1; Length 140;  
Best Local Similarity 94.4%; Pred. No. 1.80e-82;  
Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

Db 3 LPPGNYKKPKLLYCSNGGHLRLPDGTVDRSDQHIQLQLSAESVGEVYIKSTETG 62  
| : |||||  
QY 38 LLDANYKKPKLLYCSNGGHLRLPDGTVDRSDQHIQLQLSAESVGEVYIKSTETG 97  
| : |||||

Db 63 OYLAMDTGLLYGSQTPNEECFLERLEEN-----HYNTYISKKHAENWVGLKKNKNGSC 117  
| : |||||  
QY 98 OYLAMDTGLLYGSQTPNEECFLERLEENATPAPHYNTYISKKHAENWVGLKKNKNGSC 157  
| : |||||

Db 118 KRGRPRTHYGOKAILFLPLPVSSD 140  
| : |||||  
QY 158 KRGRPRTHYGOKAILFLPLPVSSD 180  
| : |||||

RESULT 7  
ID R10527 standard; Protein; 141 AA.  
AC R10527;  
DT 15-APR-1991 (first entry)  
DE Human acidic fibroblast growth factor gene.  
DE aFGF; antibody; antigen; cancer; ss.  
DE Homo sapiens.  
FT Key Location/Qualifiers  
FT region 2..12  
FT /label= A  
FT region 56..67  
FT /label= B  
FT region 104..114  
FT /label= C  
FT region 132..141  
FT /label= D  
PN J02306996-A.  
PD 20-DEC-1990.  
PF 03-JUL-1989; 172542.  
PR 04-JUL-1988; JP-166275.  
PR 03-JUL-1989; JP-172542.  
PA (TAKE ) TAKEDA CHEMICAL IND KK.  
DR WPI: 91-040150/06.  
DR N-PSDB; Q10399.  
PT Anti-acid antibody, for cancer diagnosis, etc. - is obt'd. by  
PT using complex of partial peptide(s) of acid fibroblast growth  
PT factor and protein as antigen.  
PS Disclosure; Fig 1; 19pp; Japanese.  
CC The was deduced from a gene used to produce recombinant aFGF.  
CC Peptides derived from the protein, esp. from A-D can be used to as  
CC antigens to produce anti-aFGF antibodies. The peptides must  
CC comprise 8-10 continuous AAs from A or B (claims 5 and 6 resp.),  
CC 7-10 continuous AAs from C (claim 7), or 8-9 continuous AAs from D  
CC (claim 8). The Abs can be used for immunochemically measuring aFGF,  
CC and for purifying aFGF. They are useful as reagents in the diag-  
CC nosis of various cancers or diseases of the CNS. Purified aFGF  
CC has wound healing and nerve cell proliferating properties.  
SQ Sequence 141 AA;

Query Match 71.9%; Score 931; DB 1; Length 141;  
Best Local Similarity 94.4%; Pred. No. 1.80e-82;  
Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

Db 4 LPPGNYKKPKLLYCSNGGHLRLPDGTVDRSDQHIQLQLSAESVGEVYIKSTETG 63  
| : |||||  
QY 38 LLDANYKKPKLLYCSNGGHLRLPDGTVDRSDQHIQLQLSAESVGEVYIKSTETG 97  
| : |||||

Db 64 OYLAMDTGLLYGSQTPNEECFLERLEEN-----HYNTYISKKHAENWVGLKKNKNGSC 118  
| : |||||  
QY 98 OYLAMDTGLLYGSQTPNEECFLERLEENATPAPHYNTYISKKHAENWVGLKKNKNGSC 157  
| : |||||

Db 119 KRGRPRTHYGOKAILFLPLPVSSD 141  
| : |||||  
QY 158 KRGRPRTHYGOKAILFLPLPVSSD 180  
| : |||||

RESULT 8

DR R05789 standard; Protein; 151 AA.  
AC R05789;  
DT 22-AUG-1990 (first entry)  
DE Human aFGF encoded by synthetic gene.  
KW Acidic fibroblast growth factor; aFGF; thrombogenesis;  
KW atherosclerosis; tumors.  
FH Synthetic.  
FH Key Location/Qualifiers  
FT misc\_difference 146..147  
FT /note= "sites corresp. to two stop codons of  
FT the DNA sequence"  
FN GB2223496-A.  
PD 11-APR-1990.  
PF 08-AUG-1988; 018775.  
PR 08-AUG-1988; GB-018775.  
PA (BRI-) Brit Bio-Tech Ltd.  
PI Davies JA, Johnson ID;  
DR WPI; 90-109882/15.  
DS N-PSDB; Q03873.  
SQ Gene encoding human acidic fibroblast growth factor -  
incorporates useful restriction sites at frequent intervals to  
facilitate cassette mutagenesis of specified regions.  
PS Claim 2; Fig 3a; 12pp; English.  
CC The synthetic aFGF gene incorporates useful restriction sites at  
CC frequent intervals to facilitate the cassette mutagenesis of  
CC selected regions. Also included are flanking sites to simplify  
CC the incorporation of the gene into any expression system.  
CC The aFGF mol. acts in a cascade effect to control endothelial cell  
CC activity either co-ordinately through synergistic effects or via  
CC independent routes. The regulation of endothelial cells is essential  
CC for the protection of arteries, veins and capillaries from the effect  
CC of thrombogenesis. Their stimulation and control by these factors is  
CC also thought to be important in the development of tumours and  
CC atherosclerosis.  
SQ Sequence 151 AA;

Query Match 71.9%; Score 931; DB 1; Length 151;  
Best Local Similarity 94.4%; Pred. No. 1.80e-82;  
Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

Db 8 LPPGNYKKPKLLYCSNGGHFLRLIPDGTVDGTRDRSDQHILQLSAESVGEVIKSTETG 67  
QY 38 LLDANYKKPKLLYCSNGGHFLRLIPDGTVDGTRDRSDQHILQLSAESVGEVIKSTETG 97  
Db 68 QYLANDTDGLLYGSQTPNEECFLERLEEN-----HYNTYISKHAEKNWFVGLKKNKSC 122  
QY 98 QYLANDTDGLLYGSQTPNEECFLERLEENATPAPHYNTYISKHAEKNWFVGLKKNKSC 157  
123 KRGPRTHYGOKAILFLPLPVSSD 145  
QY 158 KRGPRTHYGOKAILFLPLPVSSD 180

RESULT 9  
ID W92283 standard; protein; 154 AA.  
AC W92283;  
DT 20-APR-1999 (first entry)  
DE Human beta-endothelial cell growth factor (ECGF) protein sequence.  
KW Endothelial cell growth factor; ECGF; cleavable; recombinant; repair;  
KW regenerate; blood vessel; endothelial cell; human.  
OS Homo sapiens.  
PN US5849538-A.  
PD 15-DEC-1998. 840088.  
PF 11-APR-1997; US-743261.  
PR 04-NOV-1996; US-835594.  
PR 03-MAR-1986; US-835594.  
PR 18-DEC-1987; US-134499.  
PR 29-APR-1991; US-693079.  
PR 27-NOV-1991; US-799859.  
PR 03-NOV-1994; US-334884.  
PR 11-APR-1997; US-840088.  
PA (RHON ) RHONE-POULENC RORER PHARM INC.

Query Match 71.9%; Score 931; DB 1; Length 154;  
Best Local Similarity 94.4%; Pred. No. 1.80e-82;  
Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

Db 17 LPPGNYKKPKLLYCSNGGHFLRLIPDGTVDGTRDRSDQHILQLSAESVGEVIKSTETG 76  
QY 38 LLDANYKKPKLLYCSNGGHFLRLIPDGTVDGTRDRSDQHILQLSAESVGEVIKSTETG 97  
Db 77 QYLANDTDGLLYGSQTPNEECFLERLEEN-----HYNTYISKHAEKNWFVGLKKNKSC 131  
QY 98 QYLANDTDGLLYGSQTPNEECFLERLEENATPAPHYNTYISKHAEKNWFVGLKKNKSC 157  
132 KRGPRTHYGOKAILFLPLPVSSD 154  
QY 158 KRGPRTHYGOKAILFLPLPVSSD 180

RESULT 10  
ID W04805 standard; Protein; 154 AA.  
AC W04805;  
DT 29-DEC-1996 (first entry)  
DE Human beta-endothelial cell growth factor.  
KW Endothelial cell growth factor; ECGF; blood vessel; regeneration;  
KW heparin-Sepharose affinity chromatography; probe; oligonucleotide;  
KW FGF; fibroblast growth factor.  
OS Homo sapiens.  
PN US5552528-A.  
PD 03-SEP-1996.  
PF 03-MAR-1986; 835594.  
PR 03-MAR-1986; US-835594.  
PR 18-DEC-1987; US-134499.  
PR 29-APR-1991; US-693079.  
PR 27-NOV-1991; US-799859.  
PR 03-NOV-1994; US-334884.  
PA (RHON ) RHONE-POULENC RORER PHARM INC.  
PI Burgess W, Maciag T;  
DR WPI; 96-412132/41.  
DR N-PSDB; T37503.  
PT Isolated, purified, biologically active bovine beta endothelial cell  
PT growth factor - useful to regenerate or treat damaged blood vessels  
PS Disclosure; Fig. 8; 28pp; English.  
CC Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having  
CC a mol.wt. of 20 kD can be purified at least 16300 fold from bovine  
CC brain using heparin-Sepharose affinity chromatography. ECGF is  
CC useful for, among other purposes, diagnostic applications and has  
CC potential in the treatment of damaged blood vessels or other  
CC endothelial cell-lined structures.  
CC Human ECGF (T37503) or fragments may be obtained using  
CC oligonucleotides (T37504 and T37508 to T37509) whose design is based  
CC on the sequence of bovine alpha- and beta-ECGF.  
SQ Sequence 154 AA;

Query Match 71.9%; Score 931; DB 1; Length 154;  
Best Local Similarity 94.4%; Pred. No. 1.80e-82;  
Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

Db 17 LPPGNYKKPKLLYCSNGGHFLRLIPDGTVDGTRDRSDQHILQLSAESVGEVIKSTETG 76  
QY 38 LLDANYKKPKLLYCSNGGHFLRLIPDGTVDGTRDRSDQHILQLSAESVGEVIKSTETG 97  
Db 77 QYLANDTDGLLYGSQTPNEECFLERLEEN-----HYNTYISKHAEKNWFVGLKKNKSC 131  
QY 98 QYLANDTDGLLYGSQTPNEECFLERLEENATPAPHYNTYISKHAEKNWFVGLKKNKSC 157  
132 KRGPRTHYGOKAILFLPLPVSSD 154  
QY 158 KRGPRTHYGOKAILFLPLPVSSD 180

Query Match 71.9%; Score 931; DB 1; Length 154;  
Best Local Similarity 94.4%; Pred. No. 1.80e-82;  
Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

Db 17 LPPGNYKKPKLLYCSNGGHFLRLIPDGTVDGTRDRSDQHILQLSAESVGEVIKSTETG 76  
QY 38 LLDANYKKPKLLYCSNGGHFLRLIPDGTVDGTRDRSDQHILQLSAESVGEVIKSTETG 97  
Db 77 QYLANDTDGLLYGSQTPNEECFLERLEEN-----HYNTYISKHAEKNWFVGLKKNKSC 131  
QY 98 QYLANDTDGLLYGSQTPNEECFLERLEENATPAPHYNTYISKHAEKNWFVGLKKNKSC 157  
132 KRGPRTHYGOKAILFLPLPVSSD 154  
QY 158 KRGPRTHYGOKAILFLPLPVSSD 180

QY 38 LLDANYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97  
 Db 77 QYLANDTDGLLYGSGTPNEECFLERLEEN-----HYNTYISKHAEKNWVGLKKNKNGSC 131  
 QY 98 QYLANDTDGLLYGSGTPNEECFLERLEENATPAPHYNTYISKHAEKNWVGLKKNKNGSC 157  
 Db 132 KRGRPTHYQKAILFLPLPVSSD 154  
 QY 158 KRGRPTHYQKAILFLPLPVSSD 180

RESULT 11  
 ID W06816 standard; Protein; 154 AA.  
 AC W06816;  
 DT 17-MAR-1997 (first entry)  
 DE Human endothelial cell growth factor-beta.  
 KW Endothelial cell growth factor-beta; ECGF-beta.  
 OS Homo sapiens.  
 PN US5571790-A.  
 PD 05-NOV-1996.  
 PR 03-MAR-1986; 835594.  
 PR 03-MAR-1986; US-835594.  
 PR 18-DEC-1987; US-134499.  
 PR 29-APR-1991; US-693079.  
 PR 27-NOV-1991; US-799859.  
 PR 03-NOV-1994; US-334884.  
 PR 07-JUN-1995; US-472964.  
 PA (RHON ) RHONE-POULENC RORER PHARM INC.  
 PI Burgess W, Drohan WN, Jaye M, Maciag T;  
 DR WPI; 96-505421/50.  
 DT Recombinant human endothelial cell growth factors - for treating  
 PT damaged blood vessels, etc.  
 PS Claim 1; Column 16; 22pp; English.  
 CC Human recombinant endothelial cell growth factors (ECGF) beta  
 CC (W06816) and alpha (W06817) differ only at their N-terminal ends.  
 CC They can be produced in transformed prokaryotic or eukaryotic host  
 CC cells using DNA sequences (T45983 and T45984, respectively) derived  
 CC from the complete human ECGF cDNA (T45985). Large quantities of  
 CC the ECGFs are produced by culturing the host cells and recovering  
 CC the proteins. ECGFs have utility in the growth and amplification  
 CC of endothelial cells in culture. They can potentially be used to  
 CC treat damaged blood vessels and other endothelial cell-lined  
 CC structures, and also have diagnostic applns.  
 SQ Sequence 154 AA;

Query Match 71.9%; Score 931; DB 1; Length 154;  
 Best Local Similarity 94.4%; Pred. No. 1.80e-82;  
 Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

QY 17 LPPGNYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 76  
 Db 38 LLDANYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97  
 Db 77 QYLANDTDGLLYGSGTPNEECFLERLEEN-----HYNTYISKHAEKNWVGLKKNKNGSC 131  
 QY 98 QYLANDTDGLLYGSGTPNEECFLERLEENATPAPHYNTYISKHAEKNWVGLKKNKNGSC 157

RESULT 12  
 ID W75414 standard; Protein; 154 AA.  
 AC W75414;  
 DT 02-MAR-1999 (first entry)  
 DE Human beta-endothelial cell growth factor.  
 KW Human; endothelial cell growth factor; ECGF; brain stem; probe;  
 KW hybridisation; bovine; wound healing; prosthetic device.  
 OS Homo sapiens.  
 PN US5827826-A.  
 PD 27-OCT-1998.

Query Match 71.9%; Score 931; DB 1; Length 154;  
 Best Local Similarity 94.4%; Pred. No. 1.80e-82;  
 Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

PF 04-NOV-1996; 743261.  
 PR 04-NOV-1996; US-743261.  
 PR 03-MAR-1986; US-835594.  
 PR 18-DEC-1987; US-134499.  
 PR 29-APR-1991; US-693079.  
 PR 27-NOV-1991; US-799859.  
 PR 03-NOV-1994; US-334884.  
 PR 07-JUN-1995; US-472964.  
 PA (RHON ) RHONE-POULENC RORER PHARM INC.  
 PI Burgess W, Drohan WN, Jaye M, Maciag T;  
 DR WPI; 98-594032/50.  
 DT Compositions for promoting wound healing - containing endothelial  
 PT cell growth factor polypeptides  
 PS Claim 1; Column 16; 23pp; English.  
 CC This sequence represents the amino acid sequence of the mature human  
 CC beta-endothelial cell growth factor (b-ECGF). This amino acid sequence  
 CC is identical to the alpha-ECGF but the beta sequence contains an extra  
 CC 20 N-terminal amino acids. The sequence was isolated from a human brain  
 CC stem cell cDNA library using a probe designed based on fragments of the  
 CC bovine ECGF (see W75416-W75418). The ECGF protein can be used in  
 CC compositions for promoting wound healing. ECGF is also used to grow  
 CC cells on a prosthetic device.  
 SQ Sequence 154 AA;

Query Match 71.9%; Score 931; DB 1; Length 154;  
 Best Local Similarity 94.4%; Pred. No. 1.80e-82;  
 Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

Db 17 LPPGNYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 76  
 QY 38 LLDANYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97  
 Db 77 QYLANDTDGLLYGSGTPNEECFLERLEEN-----HYNTYISKHAEKNWVGLKKNKNGSC 131  
 QY 98 QYLANDTDGLLYGSGTPNEECFLERLEENATPAPHYNTYISKHAEKNWVGLKKNKNGSC 157

Db 132 KRGRPTHYQKAILFLPLPVSSD 154  
 QY 158 KRGRPTHYQKAILFLPLPVSSD 180

RESULT 13  
 ID P94037 standard; Protein; 155 AA.  
 AC P94037;  
 DT 25-JUN-1990 (first entry)  
 DE Human acidic fibroblast growth factor.  
 KW Acidic fibroblast growth factor.  
 OS Homo sapiens.  
 PN EP-298723-A.  
 PD 11-JAN-1989.  
 PR 06-JUL-1988; 306158.  
 PR 07-JUL-1987; US-070797.  
 PA (BIOT-) Biotech Res Assoc.  
 PI Fiddes JC, Abraham JA, Protter A;  
 DR WPI; 89-009785/02.  
 DR N-PSDB; N93088.  
 PT Recombinant DNA encoding new fibroblast growth factor  
 PT analogues - useful eg for accelerating wound healing and  
 PT to control neovascularisation.  
 PS Disclosure; p; English.  
 CC See also P94038.  
 SQ Sequence 155 AA;

Query Match 71.9%; Score 931; DB 1; Length 155;  
 Best Local Similarity 94.4%; Pred. No. 1.80e-82;  
 Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

Db 18 LPPGNYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 77  
 QY 38 LLDANYKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97  
 Db 78 QYLANDTDGLLYGSGTPNEECFLERLEEN-----HYNTYISKHAEKNWVGLKKNKNGSC 132

QY 98 QYLANDTDGLLYGSGTNEECFLERLEENATPAPHYNTYISKHAEKNWFVGLKKNKGC 157  
Db 133 KRGPRTYHGYOKAILFLPLPVSSD 155  
QY 158 KRGPRTYHGYOKAILFLPLPVSSD 180

## RESULT 14

ID R70812 standard; protein; 155 AA.  
AC R70812;  
DT 01-SEP-1995 (first entry)  
DE FGF-1.  
KW FGF-1; fibroblast growth factor; cytotoxic conjugate; fusion protein;  
OS saporin; cytostatic; tumor; diabetes; rheumatoid arthritis.  
FH Homo sapiens.  
FT misc\_difference 31 Location/Qualifiers  
FT misc\_difference 132 /note= "Cys may be replaced by Ser"  
FT misc\_difference 132 /note= "Cys may be replaced by Ser"  
W09503831-A.  
PD 09-FEB-1995.  
PF 27-JUL-1994; U08511.  
PR 02-AUG-1993; US-099924.  
PR 29-OCT-1993; US-145829.  
PA (PRIZ-) PRIZM PHARM INC.  
PA (WHIT-) WHITTIER INST DIABETES & ENDOCRINOLOGY.  
PI Baird AJ, Lappi DA, Sosnowski BA;  
DR WPI; 95-082038/11.  
PT New monogenic preparations of cytotoxic conjugates and DNA -  
PT contain fibroblast growth factors and cytotoxic agents for  
PT treating FGF conditions such as tumors, diabetes and rheumatoid  
PT arthritis.  
PS Disclosure; Page 108-109; 128pp; English.  
CC Novel fusion proteins comprise FGF linked to saporin. FGF-1 to -9  
CC may be used, pref. FGF-1 (R70812), FGF-5 (R70813), FGF-7 (R70814) or  
CC FGF-8 (R70815) muteins, in which at least 1 Cys residue is replaced  
CC by conservative Ser substitutions. The fusion proteins are potent  
CC cytotoxic agents to cells bearing the FGF receptor.  
SQ Sequence 155 AA;

Query Match 71.9%; Score 931; DB 1; Length 155;  
Best Local Similarity 94.4%; Pred. No. 1.80e-82;  
Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

Db 18 LPPGNYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHILQLLSAESVGEVIKSTETG 77  
| :|||||  
38 LLDANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHILQLLSAESVGEVIKSTETG 97  
| :|||||  
Db 78 QYLANDTDGLLYGSGTNEECFLERLEENATPAPHYNTYISKHAEKNWFVGLKKNKGC 132  
| :|||||  
QY 98 QYLANDTDGLLYGSGTNEECFLERLEENATPAPHYNTYISKHAEKNWFVGLKKNKGC 157  
| :|||||  
Db 133 KRGPRTYHGYOKAILFLPLPVSSD 155  
| :|||||  
QY 158 KRGPRTYHGYOKAILFLPLPVSSD 180  
| :|||||

## RESULT 15

ID P70482 standard; protein; 155 AA.  
AC P70482;  
DT 13-MAY-1991 (first entry)  
DE Sequence encoded by complete cDNA sequence of human endothelial  
DE cell growth factor (ECGF).  
KW Endothelial cell regeneration; blood vessel regeneration.  
OS Homo sapiens.  
FH Key Location/Qualifiers  
FT protein 2..15  
FT /label= Beta ECGF  
FT protein 16..21  
FT /label= Acidic FGF  
FT protein 22..155  
FT /label= Alpha ECGF

PN W08705332-A.  
PD 11-SEP-1987.  
PF 03-MAR-1987; U00425.  
PR 03-MAR-1987; US-835594.  
PR 26-MAR-1987; ES-000812.  
PA (MELO-) MELOY LAB INC.  
PA (RORE-) RORER BIOTECHN INC.  
PA (RORE-) RORER.  
PA BIOTECH INC.  
PI Jaye M, Burgess W, Maciag T, Drohan W;  
DR WPI; 87-264128/37.  
DR N-PSDB; N70788  
PT Human endothelial cell growth factor - produced by recombinant  
PT DNA techniques, useful for wound healing  
PS Example; Fig 8; 43pp; English.  
CC To screen the human brain stem cDNA library for clones contg. ECGF  
CC inserts, a specific oligonucleotide was designed. This  
CC oligonucleotide was based upon a partial AA sequence analysis of  
CC the amino terminus of ECGF (see P70480 and P70481). Fig 3c sets  
CC forth for comparison the AA sequence of cyanogen bromide-cleaved  
CC bovine alpha and beta ECGF (P70834). The two clones that were  
CC isolated, ECGF clones 1 and 29, were analysed in further detail. The  
CC nucleotide sequence of these clones and the AA sequence deduced from  
CC the nucleic acid sequence is shown in Fig 8 (see N70788 and P70482).  
SQ Sequence 155 AA;

Query Match 71.9%; Score 931; DB 1; Length 155;  
Best Local Similarity 94.4%; Pred. No. 1.80e-82;  
Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

Db 18 LPPGNYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHILQLLSAESVGEVIKSTETG 77  
| :|||||  
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHILQLLSAESVGEVIKSTETG 97  
| :|||||  
Db 78 QYLANDTDGLLYGSGTNEECFLERLEENATPAPHYNTYISKHAEKNWFVGLKKNKGC 132  
| :|||||  
QY 98 QYLANDTDGLLYGSGTNEECFLERLEENATPAPHYNTYISKHAEKNWFVGLKKNKGC 157  
| :|||||  
Db 133 KRGPRTYHGYOKAILFLPLPVSSD 155  
| :|||||  
QY 158 KRGPRTYHGYOKAILFLPLPVSSD 180  
| :|||||

Search completed: Tue Aug 29 16:18:04 2000  
Job time : 16 secs.

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MPSrch\_pp protein - protein database search, using Smith-Waterman algorithm  
on: Tue Aug 29 16:17:11 2000; MasPar time 11.21 Seconds  
757.271 Million cell updates/sec  
Molecular output not generated.

Title: >US-09-121-017B-29  
Description: (1-180) from US09121017B.pep  
Perfect Score: 1294  
Sequence: 1 MSRGAGRVQGTIALQALVFLGV.....PRTHYGOKAILFLPLPVSSD 180

Scoring table: PAM 150  
Gap 11  
Searched: 142080 seqs, 47172406 residues  
Post-processing: Minimum Match 08  
Listing first 45 summaries  
Database: pir64  
1:pir1 2:pir2 3:pir3 4:pir4  
Statistics: Mean 43.414; Variance 75.912; scale 0.572

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description	Pred. No.
1	931	71.9	155	1	A33665 acidic fibroblast gro	2.21e-185
2	914	70.6	155	1	A60721 acidic fibroblast gro	2.38e-181
3	911	70.4	155	2	D37360 acidic fibroblast gro	1.23e-180
4	911	70.4	155	2	S04147 acidic fibroblast gro	1.23e-180
5	900	69.6	155	2	JH0476 acidic fibroblast gro	4.95e-178
6	862	66.6	155	1	GKBOA acidic fibroblast gro	4.87e-169
7	851	66.5	155	2	A60130 acidic fibroblast gro	8.40e-169
8	851	65.8	155	2	JW0055 fibroblast growth fac	1.94e-166
9	475	36.7	189	2	A48834 basic fibroblast grow	4.56e-79
10	469	36.2	157	1	GKBOB basic fibroblast grow	1.04e-77
11	462	35.7	146	1	S00185 basic fibroblast grow	4.00e-76
12	462	35.7	210	2	A32398 basic fibroblast grow	4.00e-76
13	458	35.4	154	2	A31674 basic fibroblast grow	3.21e-75
14	453	35.0	154	2	C37360 basic fibroblast grow	3.21e-74
15	450	34.8	164	2	S31622 basic fibroblast grow	2.05e-73
16	438	33.8	155	1	A40117 basic fibroblast grow	1.03e-70
17	418	32.3	137	2	I46711 fibroblast growth fac	3.16e-66
18	316	24.4	208	2	A48137 fibroblast growth fac	9.00e-44
19	316	24.4	208	2	S66486 fibroblast growth fac	9.00e-44
20	288	23.0	207	2	JCS941 fibroblast growth fac	6.64e-40
21	293	22.6	207	2	JCS940 fibroblast growth fac	7.76e-39
22	280	21.6	208	2	S14192 fibroblast growth fac	4.49e-36
23	267	20.6	60	2	JH0708 fibroblast growth fac	2.47e-33

ALIGNMENTS

RESULT ENTRY	1	20.1	220	2	I50588	7.22e-32
TITLE		253	264	2	A36207 transforming protein	2.08e-30
ALTERNATE_NAMES		253	266	2	S68144 fibroblast growth fac	2.08e-30
ORGANISM		248	194	2	S49501 keratinocyte growth f	2.26e-29
DATE		248	208	2	S20102 fibroblast growth fac	2.26e-29
ACCESSIONS		248	267	1	TVHUF5 transforming protein	2.26e-29
REFERENCE		248	194	1	A36301 fibroblast growth fac	9.42e-29
		245	237	1	S39582 transforming protein	9.42e-29
		241	187	2	S23595 embryonic fibroblast	6.29e-28
		241	186	2	I48610 keratinocyte growth f	6.29e-28
		239	194	2	S26049 fibroblast growth fac	1.02e-27
		238	168	2	JG0184 fibroblast growth fac	2.50e-27
		237	239	1	S04742 fibroblast growth fac	4.18e-27
		235	245	1	TVWST2 transforming protein	1.07e-26
		233	180	2	I50710 fibroblast growth fac	2.75e-26
		226	192	2	S54407 embryonic Fibroblast	2.88e-25
		226	256	2	JC4627 fibroblast growth fac	7.35e-25
		222	206	2	JC4268 HST protein - bovine	4.74e-24
		209	206	1	TVHUSH fibroblast growth fac	1.93e-21
		188	202	1	TVHUSH transforming protein	2.62e-17
		181	125	2	A32484 basic fibroblast grow	5.87e-16
		179	97	2	B46289 keratinocyte growth f	1.42e-15

ACCESSIONS A33665 #type complete  
A33665 acidic fibroblast growth factor 1 precursor - human  
A33665 beta-ECGF; endothelial cell growth factor beta;  
A33665 heparin-binding growth factor 1  
A33665 #formal\_name Homo sapiens #common\_name man  
A33665 10-Sep-1999 #sequence\_revision 10-Sep-1999 #text\_change  
A33665 A33665; A32316; S18217; A43804; A24662; JH0707; S35535;  
A33665 S35536; I39413; A23553; A24820; A24243; A24301; A26386;  
A33665  
A33665 Mergia, A.; Tischer, E.; Graves, D.; Tumolo, A.; Miller, J.;  
Gospodarowicz, D.; Abraham, J.A.; Shipley, G.D.; Fiddes, J.C.  
#journal Biochem. Biophys. Res. Commun. (1989) 164:1121-1129  
#title Structural analysis of the gene for human acidic fibroblast growth factor.  
#cross-references MUID:90073637  
#accession A33665  
#molecule\_type DNA  
#residues 1-155 #label MER  
#cross-references GB:M30491  
REFERENCE A32316  
#authors Wang, W.P.; Lehtoma, K.; Varban, M.L.; Krishnan, I.; Chiu, I.M.  
#journal Mol. Cell. Biol. (1989) 9:2387-2395  
#title Cloning of the gene coding for human class 1 heparin-binding growth factor and its expression in fetal tissues.  
#cross-references MUID:89343957  
#accession A32316  
#molecule\_type DNA  
#residues 1-155 #label WAN  
#cross-references GB:M23087; NID:g183875; PIDN:AAA52638.1; PID:g386768  
REFERENCE S18217  
#authors Wang, W.P.; Quick, D.; Balcerzak, S.P.; Needleman, S.W.; Chiu, I.M.  
#journal Oncogene (1991) 6:1521-1529  
#title Cloning and sequence analysis of the human acidic fibroblast growth factor gene and its preservation in leukemia patients.  
#cross-references MUID:92019819  
#accession S18217  
#molecule\_type DNA  
#residues 1-155 #label WA2  
#cross-references EMBL:M23086  
REFERENCE A43804

```
#cross-references MUID:86295741
#accession A24820
##molecule_type protein
##residues 16-155 ##label GIM

REFERENCE
A90122
Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
Biochem. Biophys. Res. Commun. (1986) 135:541-548
#journal Human brain-derived acidic and basic fibroblast growth
#title factors: amino terminal sequences and specific mitogenic
activities
#cross-references MUID:86186784
#accession A24243
##molecule_type protein
##residues 16-47 ##label GI2
##experimental_source brain

REFERENCE
A91364
Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
FEBS Lett. (1986) 204:203-207
#journal Partial molecular characterization of endothelial cell
#title mitogens from human brain: acidic and basic fibroblast
growth factors
#cross-references MUID:86275260
#accession A24301
##molecule_type protein
##residues 16-30,'X',32-49 ##label GAU

REFERENCE
A26386
Gautschi-Sova, P.; Muller, T.; Bohlen, P.
Biochem. Biophys. Res. Commun. (1986) 140:874-880
#journal Amino acid sequence of human acidic fibroblast growth factor.
#title #cross-references MUID:87048871
#accession A26386
##molecule_type protein
##residues 16-155 ##label GA2
##experimental_source brain

REFERENCE
A53639
Chavan, A.J.; Haley, B.E.; Volkin, D.B.; Marfia, K.E.;
Verticelli, A.M.; Bruner, M.W.; Draper, J.P.; Burke, C.J.;
Middaugh, C.R.
Biochemistry (1994) 33:7193-7202
#journal Interaction of nucleotides with acidic fibroblast growth
#title factor (FGF-1).
#cross-references MUID:94271773
#accession A53639
##molecule_type protein
##residues 16-30,'X',32-38;73-75,'X',77-97,'X',99-101;128-131,'X',
133-140,'X',142-152 ##label CHA

GENETICS
#gene GDB:FGF1; FGFA
##cross-references GDB:119909; OMIM:131220
#map_position 5q31.3-q33.2
#introns 57/1; 91/3
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS alternative splicing; growth factor; heparin binding
FEATURE
16-155 #product fibroblast growth factor 1 #status experimental
129 #label MAT\
#binding_site carbohydrate (Asn) (covalent) #status
aspartate
SUMMARY #length 155 #molecular-weight 17460 #checksum 9243

Query Match 71.9%; Score 931; DB 1; Length 155;
Best Local Similarity 94.4%; Pred. No. 2.21e-185;
Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

Db 18 LPQNTYKKPKLLYCSNGGHFLRIIPDGTVDGTRDRSDQHQLQLSAESVGEVIKSTETG 77
| :|||||||
Qy 38 LLDANYKKPKLLYCSNGGHFLRIIPDGTVDGTRDRSDQHQLQLSAESVGEVIKSTETG 97
| :|||||||
Db 78 QYLAMTDGLLYGSQTNPNECLFLERLEEN-----HYNTYISKHAEKNMFVLGUKKGSC 132
| :|||||||
Qy 98 QYLAMTDGLLYGSQTNPNECLFLERLEENATPAPHYNTYISKHAEKNMFVLGUKKGSC 157
```

```

Db 133 KRGPRTYHOKAILFLPLPVSSD 155
QY 158 KRGPRTYHOKAILFLPLPVSSD 180

RESULT 2
ENTRY A60721 #type complete
TITLE acidic fibroblast growth factor - golden hamster
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Mesocricetus auratus #common_name golden hamster
DATE 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 10-Sep-1999
ACCESSIONS A60721
REFERENCE #accession A60721
#authors Hall, J.A.; Harris, M.A.; Malark, M.; Mansson, P.E.; Zhou, H.; Harris, S.E.
#journal J. Cell. Biochem. (1990) 43:17-26
#title Characterization of the hamster DDT-1 cell aFGF/HGBF-I gene and cDNA and its modulation by steroids.
#cross-references MUID:90270291
#accession A60721
#status not compared with conceptual translation
#molecule_type DNA
#residues 1-155 #label HAL
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17403 #checksum 9573

Query Match 70.6%; Score 914; DB 1; Length 155;
Best Local Similarity 92.3%; Pred. No. 2.38e-181;
Matches 132; Conservative 2; Mismatches 4; Indels 5; Gaps 1;

Db 18 LPPGNYKKPKLLYCSNGGHFLRLPDGTGTRDRSDQHIQLQLSAESAGEVYIKGTENG 77
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTGTRDRSDQHIQLQLSAESAGEVYIKSTEG 97

Db 78 QYLMPTDGLLYGSQTPNEECFLERLEEN-----HYNTYTSKKHAENWVGLKKNKSGC 132
QY 98 QYLMPTDGLLYGSQTPNEECFLERLEENATPAPHYNTYISKHAENWVGLKKNKSGC 157

Db 133 KRGPRTYHOKAILFLPLPVSSD 155
QY 158 KRGPRTYHOKAILFLPLPVSSD 180

RESULT 3
ENTRY D37360 #type complete
TITLE acidic fibroblast growth factor - mouse
ALTERNATE_NAMES aFGF; FGF-1
ORGANISM #formal_name Mus musculus #common_name house mouse
DATE 17-Apr-1993 #sequence_revision 17-Apr-1993 #text_change 16-Jul-1999
ACCESSIONS D37360; JC5231
REFERENCE #accession A37360
#authors Hebert, J.M.; Basilico, C.; Goldfarb, M.; Haub, O.; Martin, G.R.
#journal Dev. Biol. (1990) 138:454-463
#title Isolation of cDNAs encoding four mouse FGF family members and characterization of their expression patterns during embryogenesis.
#cross-references MUID:90201563
#accession D37360
#status preliminary
#molecule_type mRNA
#residues 1-155 #label HEB
#cross-references GB:M30641; NID:G193284; PIDN:AAA37618.1; PID:G309236
REFERENCE JC5231
#authors Madial, F.; Hackshaw, K.V.; Chiu, I.M.
#journal Gene (1996) 179:231-236
#title Cloning and characterization of the mouse Fgf-1 gene.
#cross-references MUID:97128312
#accession JC5231
#status preliminary

```

```

#molecule_type DNA
#residues 1-155 #label MAD
#cross-references GB:U36456
COMMENT This protein is an inducer of neovascularization in angiogenic disease including atherosclerosis, cancer and inflammatory autoimmune disease.

```

## GENETICS

```

#gene Fgf-1
#introns 57/1; 91/3
#superfamily fibroblast growth factor
CLASSIFICATION #length 155 #molecular-weight 17417 #checksum 9341
SUMMARY

```

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Query Match 70.4%; Score 911; DB 2; Length 155;
Best Local Similarity 92.9%; Pred. No. 1.23e-180;
Matches 130; Conservative 3; Mismatches 2; Indels 5; Gaps 1;

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Db 21 GNYKPKLLYCSNGGHFLRLPDGTGTRDRSDQHIQLQLSAESAGEVYIKGTGQYL 80
QY 41 ANYKPKLLYCSNGGHFLRLPDGTGTRDRSDQHIQLQLSAESVGEVYIKSTGTQYL 100

Db 81 AMDTEGLLYGSQTPNEECFLERLEEN-----HYNTYTSKKHAENWVGLKKNKSGCRG 135
QY 101 AMDTDGLLYGSQTPNEECFLERLEENATPAPHYNTYISKHAENWVGLKKNKSGCRG 160

Db 136 PRTHYGQKAILFLPLPVSSD 155
QY 161 PRTHYGQKAILFLPLPVSSD 180

```

## RESULT 4

```

ENTRY S04147 #type complete
TITLE acidic fibroblast growth factor 1 - rat
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Rattus norvegicus #common_name Norway rat
DATE 28-Feb-1990 #sequence_revision 28-Feb-1990 #text_change 16-Jul-1999
ACCESSIONS S04147
REFERENCE S04147
#authors Goodrich, S.P.; Yan, G.C.; Bahrenburg, K.; Mansson, P.E.
#journal Nucleic Acids Res. (1989) 17:2867
#title The nucleotide sequence of rat heparin binding growth factor 1 (HBGF-1).
#cross-references MUID:89240051
#accession S04147
#molecule_type mRNA
#residues 1-155 #label GOO
#cross-references EMBL:X14232; NID:G56351; PIDN:CAA32448.1; PID:G56352
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341

```

```

Query Match 70.4%; Score 911; DB 2; Length 155;
Best Local Similarity 92.9%; Pred. No. 1.23e-180;
Matches 130; Conservative 3; Mismatches 2; Indels 5; Gaps 1;

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Db 21 GNYKPKLLYCSNGGHFLRLPDGTGTRDRSDQHIQLQLSAESAGEVYIKGTGQYL 80
QY 41 ANYKPKLLYCSNGGHFLRLPDGTGTRDRSDQHIQLQLSAESVGEVYIKSTGTQYL 100

Db 81 AMDTEGLLYGSQTPNEECFLERLEEN-----HYNTYTSKKHAENWVGLKKNKSGCRG 135
QY 101 AMDTDGLLYGSQTPNEECFLERLEENATPAPHYNTYISKHAENWVGLKKNKSGCRG 160

Db 136 PRTHYGQKAILFLPLPVSSD 155
QY 161 PRTHYGQKAILFLPLPVSSD 180

```

## RESULT 5

```

ENTRY JH0476 #type fragment
TITLE acidic fibroblast growth factor - pig (fragment)
ORGANISM #formal_name Sus scrofa domestica #common_name domestic pig
DATE 31-Mar-1992 #sequence_revision 31-Mar-1992 #text_change

```

```

16-Jul-1999
JH0476; S20072
ACCESSIONS
REFERENCE
JH0476
#authors
Schmidt, M.; Sharma, H.S.; Schott, R.J.; Schaper, W.
#journal
Biochem. Biophys. Res. Commun. (1991) 180:853-859
#title
Amplification and sequencing of mRNA encoding acidic
fibroblast growth factor (aFGF) from porcine heart.
#cross-references MUID:92062117
#accession JH0476
#molecule_type mRNA
#residues 1-152 #label SCH
#cross-references EMBL:X60317; NID:g1873; PIDN:CAA42869.1; PID:g1874
#experimental_source heart
#note
internal symmetric core residues are packed around the
internal symmetry axis
COMMENT This protein belongs to the fibroblast growth factor family.
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SOURCE
22-28 #region nuclear location signal\
133 #binding_site heparin (Lys) #status predicted
SUMMARY #length 152 #checksum 1124
Query Match 69.6%; Score 900; DB 2; Length 152;
Best Local Similarity 92.1%; Pred. No. 4.95e-178;
Matches 129; Conservative 2; Mismatches 4; Indels 5; Gaps 1;
Db 18 LPPGNKPKLLYCSNGGHFRLIPDGTGTRDRSQHQLQLSASVGVYIKSTETG 77
I :|||||
Qy 38 LLDNKKPKLLYCSNGGHFRLIPDGTGTRDRSQHQLQLSASVGVYIKSTETG 97
I :|||||
Db 78 QYLAQMTSGLLYSGTSPSECLFLERLEN-----HYNTYTSKKHAENKFWGLKKGSC 132
|||||
Qy 98 QYLAQMTDGLLYSGTSPNEECFLERLEENATPAPHTNYTSKKHAENKFWGLKKGSC 157
|||||
Db 133 KRGPRTYQKRAILFLPLPV 152
|||||
Qy 158 KRGPRTYQKRAILFLPLPV 177
|||||
RESULT 6
ENTRY #type complete
TITLE acidic fibroblast growth factor precursor - bovine
ALTERNATE_NAMES aFGF: eye-derived growth factor II; heparin-binding growth
factor I; prostatin
ORGANISM #formal_name Bos primigenius taurus #common_name cattle
DATE 13-Aug-1986 #sequence_revision 03-Feb-1994 #text_change
18-Jun-1999
ACCESSIONS
JH0613; S02102; S02661; S22065; B24663; A94281; S03953;
A91010; A24477; B25043; C25043; A24539; A60884;
A37892; B37892; A61198; I46024; A34477; A01385
REFERENCE
JH0613
#authors
Renaud, F.; Desset, S.; Bugra, K.; Halley, C.; Philippe,
J.M.; Courtois, Y.; Laurent, M.
#journal
Biochem. Biophys. Res. Commun. (1992) 184:945-952
#title
Heterogeneity of 3' untranslated region of bovine acidic FGF
transcripts
#cross-references MUID:92246990
#accession JH0613
#molecule_type DNA
#residues 58-155 #label REN
REFERENCE
S02102
#authors
Halley, C.; Courtois, Y.; Laurent, M.
#journal
Nucleic Acids Res. (1988) 16:10913
#title
Nucleotide sequence of bovine acidic fibroblast growth factor
cDNA.
#cross-references MUID:89083506
#accession S02102
#molecule_type mRNA
#residues 1-155 #label HAL
#cross-references EMBL:X13221; NID:g347; PIDN:CAA31610.1; PID:g348
REFERENCE
S02661
#authors
Alterio, J.; Halley, C.; Brou, C.; Soussi, T.; Courtois, Y.;

```

```

Laurent, M.
#journal
FEBS Lett. (1988) 242:41-46
#title
Characterization of a bovine acidic FGF cDNA clone and its
expression in brain and retina.
#cross-references MUID:89078619
#accession S02661
#molecule_type mRNA
#residues 1-155 #label ALT
#cross-references EMBL:X14032; NID:g322; PIDN:CAA32192.1; PID:g323
REFERENCE
S22065
#authors
Philippe, J.M.
#submission submitted to the EMBL Data Library, May 1992
#accession S22065
#molecule_type mRNA
#residues 1-18 #label PHI
#cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
REFERENCE
A94290
#authors
Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman,
J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal
Science (1986) 233:545-548
#title
Nucleotide sequence of a bovine clone encoding the angiogenic
protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession B24663
#molecule_type mRNA
#residues 62-102 #label ABR
REFERENCE
A94281
#authors
Gimenez-Gallego, G.; Rodkey, J.; Bennett, C.; Rios-Candelore,
M.; Disalvo, J.; Thomas, K.
#journal
Science (1985) 230:1385-1388
#title
Brain-derived acidic fibroblast growth factor: complete amino
acid sequence and homologies.
#cross-references MUID:86070224
#accession A94281
#molecule_type protein
#residues 16-155 #label GIM
REFERENCE
S03953
#authors
Quinkler, W.; Maasberg, M.; Bernotat-Danielowski, S.; Luethke,
N.; Sharma, H.S.; Schaper, W.
#journal
Eur. J. Biochem. (1989) 181:67-73
#title
Isolation of heparin-binding growth factors from bovine,
porcine and canine hearts.
#cross-references MUID:89231704
#accession S03953
#molecule_type protein
#residues 16-45 #label QUI
REFERENCE
A91010
#authors
Bohlen, P.; Esch, F.; Baird, A.; Gospodarowicz, D.
#journal
EMBO J. (1985) 4:1951-1956
#title
Acidic fibroblast growth factor (FGF) from bovine brain:
amino-terminal sequence and comparison with basic FGF.
#cross-references MUID:86055750
#accession A91010
#molecule_type protein
#residues 16-30, 'X', 32-34, 'X', 36-44 #label BOH
REFERENCE
A24477
#authors
Crabb, J.W.; Ames, L.G.; Carr, S.A.; Johnson, C.M.; Roberts,
G.D.; Bordoli, R.S.; McKeenan, W.L.
#journal
Biochemistry (1986) 25:4988-4993
#title
Complete primary structure of prostatin, a prostate
epithelial cell growth factor.
#cross-references MUID:87026586
#accession A24477
#molecule_type protein
#residues 2, 'GE', 5-155 #label CRA
REFERENCE
A94127
#authors
Burgess, W.H.; Mehlman, T.; Marshak, D.R.; Fraser, B.A.;
Maciag, T.
#journal
Proc. Natl. Acad. Sci. U.S.A. (1986) 83:7216-7220
#title
Structural evidence that endothelial cell growth factor beta
is the precursor of both endothelial cell growth factor
alpha and acidic fibroblast growth factor.
#cross-references MUID:87016918

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Sasaki, H.; Saito, M.; Youki, H.; Karube, K.; Konno, S.;
Onodera, M.; Saito, T.; Aoyagi, S.
#journal J. Biol. Chem. (1989) 264:17606-17612
#title Purification of acidic fibroblast growth factor from bovine
#comment heart and its localization in the cardiac myocytes.
#cross-references MUID:90008933
#accession A34477
#status preliminary
#molecule_type protein
#residues 16-24;121-127;134-143 #label SAS
#experimental_source heart
COMMENT The acidic and basic fibroblast growth factors are the major
endothelial-cell growth factors. Both are angiogenic agents in
vivo and are potent mitogens for a variety of mesoderm-derived
cell types in vitro (although bFGF is 30-100 times more potent
than aFGF in stimulating the proliferation of normal diploid
cells). There are differences in the tissue distribution and
concentration of these two growth factors.
COMMENT This protein binds heparin, although less strongly than does bFGF
COMMENT There are some sequence similarities between residues 117-126 (a
region flanked by Lys-Lys dipeptides) and a number of
neuropeptides, including a gastrin-releasing peptide from the p
...
Note: remainder of annotations omitted.

Query Match 66.6%; Score 862; DB 1; Length 155;
Best Local Similarity 88.6%; Pred. No. 4.87e-169;
Matches 124; Conservative 6; Mismatches 5; Indels 5; Gaps 1

Db 21 GNYKKPKLLYCSNGGFLRLPLDGTVDGTRDSDQHILQLCAESIGEVIKSTETGQFL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 41 ANYKKPKLLYCSNGGHFLRLPLDGTVDGTRDSDQHILQLSAESVGVEVIKSTETGQYL 100
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

Db 81 AMDTDGLLYGQTPNECFLERLEEN-----HYNTVYSKKHAEKHWFGVLKKNGRSKLG 135
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 101 AMDTDGLLYGQTPNECFLERLEENATPAPHYNYISKKHAEKKNWFVGLKKNKSGCKRG 160
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

Db 136 PRTHFGQKAILFLPLPVSSD 155
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
QY 161 PRTHYGQKAILFLPLPVSSD 180
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

RESULT 7
ENTRY A60130 #type complete
TITLE acidic fibroblast growth factor - chicken
ALTERNATE_NAMES endothelial cell growth factor
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE 03-Mar-1993 #sequence_revision 03-Mar-1993 #text_change
16-Jul-1999
ACCESSIONS A60130; S02639
REFERENCE A60130
#authors Schnuerch, H.; Risau, W.
#journal Development (1991) 111:1143-1154
#title Differentiating and mature neurons express the acidic
fibroblast growth factor gene during chick neural
development.
#cross-references MUID:91347925
#accession A60130
#status preliminary
#molecule_type mRNA
#residues 1-155 #label SCH
#cross-references GB:S63263; NID:G234372; PIDN:AAB19629.1; PID:G234377

REFERENCE S02639
#authors Risau, W.; Gautschi-Sova, P.; Boehlen, P.
#journal EMBO J. (1988) 7:959-962
#title Endothelial cell growth factors in embryonic and adult chick
brain are related to human acidic fibroblast growth factor
#cross-references MUID:88296438
#accession S02639
#molecule_type protein
#residues 22-30,'X',32-44,'X',46-48 #label RIS
CLASSIFICATION superfamily fibroblast growth factor
KEYWORDS growth factor

```

```

SUMMARY      #length 155 #molecular-weight 17322 #checksum 7617
Query Match      66.58; Score 861; DB 2; Length 155;
Best Local Similarity 87.18; Pred. No. 8.40e-169;
Matches 122; Conservative 6; Mismatches 7; Indels 5; Gaps 1;

Db 21 GNTKKPKLLYCSNGGHFLRLPDGKVDGTRDRSDQHQLQLSADVEDGEVYIKSTAGQYL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 41 ANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHQLQLSADVEDGEVYIKSTAGQYL 100
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 81 AMDTNGLLYGSQTPSECLFLERLEEN-----HYNTYISKHAKDNMFVGLKKNKSKLG 135
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 101 AMDTDGLLYGSQTPNECLFLERLEENATPAPHYNTYISKHAEKNWFVGLKKNKSKRG 160
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 136 PRTHYGOKAILFLPLPVSSAD 155
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 161 PRTHYGOKAILFLPLPVSSD 180
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

MULT 8
ENTRY      JW0055 #type complete
TITLE      fibroblast growth factor-1 - sheep
ALTERNATE_NAMES      FGF-1
ORGANISM      #formal_name Ovis sp. #common_name sheep
DATE      17-Jun-1998 #sequence_revision 10-Jul-1998 #text_change
07-May-1999
ACCESSIONS      JW0055
REFERENCE      JW0055
#authors      Griebel, T.W.; Ring, M.; Brown, E.; Palmer, C.; Belle, N.;
DonjerKovic, D.; Chang, H.; Yun, J.; Subramanian, R.;
Forozan, F.; Guo, Y.; Vertes, A.; Winkles, J.A.; Burgess,
W.H.
#journal      Biochem. Biophys. Res. Commun. (1998) 246:182-191
#title      Primary structure of ovine fibroblast growth factor-1 deduced
by protein and cDNA analysis.
#cross-references      MUID:98262939
#accession      JW0055
#molecule_type      mRNA
#residues      1-155 #label GRI
COMMENT      This protein is a potent mitogenic factor for NIH 3T3 fibroblasts
in the absence of heparin.
CLASSIFICATION      #superfamily fibroblast growth factor
SUMMARY      #length 155 #molecular-weight 17557 #checksum 8890
Query Match      65.88; Score 851; DB 2; Length 155;
Best Local Similarity 87.18; Pred. No. 1.94e-166;
Matches 122; Conservative 8; Mismatches 5; Indels 5; Gaps 1;

Db 21 GNTKKPKLLYCSNGGHFLRLPDGKVDGTRDRSDQHQLQLSADVEDGEVYIKSTAGQYL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 41 ANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHQLQLSADVEDGEVYIKSTAGQYL 100
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 81 AMDTNGLLYGSQTPSECLFLERLEEN-----HYNTYISKHAEKNMFVGLKKNKSKLG 135
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 101 AMDTDGLLYGSQTPNECLFLERLEENATPAPHYNTYISKHAEKNWFVGLKKNKSKRG 160
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 136 PRTHYGOKAILFLPLPVSSD 155
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 161 PRTHYGOKAILFLPLPVSSD 180
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 9
ENTRY      A48834 #type complete
TITLE      basic fibroblast growth factor - chicken
ORGANISM      #formal_name Gallus gallus #common_name chicken
DATE      01-Dec-1993 #sequence_revision 18-Nov-1994 #text_change
16-Jul-1999
ACCESSIONS      A48834; S23636
REFERENCE      A48834
#authors      Borja, A.Z.; Meijers, C.; Zeller, R.
#journal      Dev. Biol. (1993) 157:110-118
#title      Expression of alternatively spliced bFGF first coding exons
and antisense mRNAs during chicken embryogenesis.

#cross-references      MUID:93246053
#accession      A48834 preliminary
#molecule_type      nucleic acid
#residues      1-189 #label BOR
#experimental_source      embryo
#note      sequence extracted from NCBI backbone (NCBIN:131000,
NCBIP:131001)
REFERENCE      S23636
#authors      Mitani, E.; Gruenbaum, Y.; Shohat, H.; Ziv, T.
#journal      Development (1990) 109:387-393
#title      Fibroblast growth factor during mesoderm induction in the
early chick embryo.
#cross-references      MUID:90382254
#accession      S23636 preliminary
#status      preliminary
#molecule_type      DNA
#residues      95-128 #label MIT
#cross-references      EMBL:X56804; NID:g62855; PIDN:CAA40139.1; PID:g62856
CLASSIFICATION      #superfamily fibroblast growth factor
SUMMARY      #length 189 #molecular-weight 20312 #checksum 8538
Query Match      36.7%; Score 475; DB 2; Length 189;
Best Local Similarity 48.7%; Pred. No. 4.56e-79;
Matches 75; Conservative 29; Mismatches 43; Indels 7; Gaps 2;

Db 43 LPALPDGGGGGAFPGHFKDPRLYCKNGGFLRLNPDGRVDGVREKSDPHIKLQLOAE 102
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 26 VPSAGARANGTLLDANYKKPKLLYCSNGGHFLRLPDGTVDRSDQHQLQLSAD 85
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Db 103 RGVSITKGSYANRFLAMKEDGRLLALKATECFERLESN-----NYNTYRSRYSYD- 156
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QY 86 VGEVIKSTETQYLAQMDTGLLYGSQTPNECLFLERLEENATPAPHYNTYISKHAEK 145
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Db 157 -WYVALKRTGQYKPGKPTGPGKAILFLPMSAKS 189
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QY 146 NWFVGLKKNKSGKRGPRTHYGOKAILFLPLPVSS 179
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 10
ENTRY      GRBOB #type fragment
TITLE      basic fibroblast growth factor precursor - bovine (fragment)
ALTERNATE_NAMES      bFGF; kidney-derived growth factor; prostatin
ORGANISM      #formal_name Bos primigenius taurus #common_name cattle
DATE      13-Aug-1986 #sequence_revision 02-Jun-1995 #text_change
10-Sep-1999
ACCESSIONS      A24663; A32878; A33784; A61550; A61551; A60310; A61094;
A01386; A60316; A22054; A24819
REFERENCE      A94290
#authors      Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman,
J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal      Science (1986) 233:545-548
#title      Nucleotide sequence of a bovine clone encoding the angiogenic
protein, basic fibroblast growth factor.
#cross-references      MUID:86261806
#accession      A24663
#molecule_type      mRNA
#residues      3-157 #label ABR
#cross-references      GB:M1340; NID:g163049; PIDN:AAA30518.1; PID:g163050
#experimental_source      pituitary gland
REFERENCE      A90924
#authors      Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes,
J.C.
#journal      Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668
#title      Human basic fibroblast growth factor: nucleotide sequence,
genomic organization, and expression in mammalian cells.
#cross-references      MUID:87217066
#accession      A32878
#molecule_type      mRNA
#residues      3-157 #label AB2
REFERENCE      A33784
#authors      Milner, P.G.; Li, Y.S.; Hoffman, R.M.; Kodner, C.M.; Siegel,
N.R.; Deuel, T.F.

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#acc
#crd
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ORGANISM      #formal_name Ovis orientalis aries, Ovis ammon aries
#common_name domestic sheep
DATE          10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change
10-Sep-1999
ACCESSIONS    S00185
REFERENCE      #authors
Simpson, R.J.; Moritz, R.L.; Lloyd, C.J.; Fabri, L.J.; Nice,
E.C.; Rubira, M.R.; Burgess, A.W.
#journal      FERS Lett. (1987) 224:128-132
#title        Primary structure of ovine pituitary basic fibroblast growth
factor.
#cross-references MUID:88055577
#accession    S00185
#molecule_type protein
#residues     1-146 #label SIM
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS       growth factor; heparin binding; mitogen
FEATURE
18-22         #region heparin binding #status predicted\
107-110       #region heparin binding #status predicted
SUMMARY        #length 146 #molecular_weight 16434 #checksum 3560
Query Match   35.7%; Score 462; DB 1; Length 146;
Best Local Similarity 49.0%; Pred. No. 4.00e-76;
Matches       75; Conservative 29; Mismatches 42; Indels 7; Gaps 2;
Db 1 PALPEDGSSAFPPGHPKPKRYLCKNGFFLRHPDGRVDGVRKSDPHIKLQAEER 60
: : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY 27 PSPAGARANGTLLDANKPKPKLYCSNGHFLRLPDGTVDGTRDSQHQIQLSAESV 86
: : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
Db 61 GVYSIKVCANRYLAKMEDGLLASKCVTDECFEERLESN----NYNYRGRKYS--S 113
: : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY 87 GEVTKRTGQYLAAMDGLLYGSGTPNEECFLERLEENATPAPHNTYISKHAEKN 146
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Db 114 WYVALKRTGQYKLGKTPGQKAILFLPMSAKS 146
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QY 147 WFGVLLKNGSKRGPRHYGKAILFLPLPVSS 179
: : : : : : : : : : : : : : : : : : : : : : : : : : : : : :

RESULT 12
ENTRY    #type complete
TITLE    basic fibroblast growth factor precursor, 22.5K form - human
ALTERNATE_NAMES bFGF; fibroblast growth factor 2; prostatic growth factor;
prostatropin
CONTAINS  basic fibroblast growth factor, 18K form
ORGANISM  #formal_name Homo sapiens #common_name man
DATE      31-Jul-1989 #sequence_revision 31-Dec-1993 #text_change
16-Jul-1999
SESSIONS  A32398; A61537; A26642; B32878; S00297; A54316; B54316;
A33624; A25824; B24243; B24301; S42242; B55784; I52267;
S46253
REFERENCE A32398
#authors  Prats, H.; Kaghad, M.; Prats, A.C.; Klagsbrun, M.; Lelias,
J.M.; Llauren, P.; Chalon, P.; Tauber, J.P.; Amalric, F.;
Smith, J.A.; Caput, D.
#journal  Proc. Natl. Acad. Sci. U.S.A. (1989) 86:1836-1840
#title    High molecular mass forms of basic fibroblast growth factor
are initiated by alternative CUG codons.
#cross-references MUID:89184522
#accession A32398
#molecule_type mRNA
#residues  1-210 #label PRA
#cross-references GB:J04513; NID:g183083; PIDN:AAA52531.1; PID:g459811
REFERENCE A61537
#authors  Shibata, F.; Baird, A.; Florkiewicz, R.Z.
#journal  Growth Factors (1991) 4:277-287
#title    Functional characterization of the human basic fibroblast
growth factor gene promoter.
#cross-references MUID:92110035
#accession A61537
#molecule_type DNA
#residues  1-114 #label SHI
#note     authors translated the codon GGA for residue 47 as Ala

```

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REFERENCE      A26642
#authors      Kurokawa, T.; Sasada, R.; Iwane, M.; Igarashi, K.
#journal      FERS Lett. (1987) 213:189-194
#title        Cloning and expression of cDNA encoding human basic
fibroblast growth factor.
#cross-references MUID:87162468
#accession    A26642
#molecule_type mRNA
#residues     56-210 #label KUR
#cross-references GB:M27968; NID:g182562; PIDN:AAA52448.1; PID:g182563
REFERENCE      A30924
#authors      Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes,
J.C.
#journal      Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668
#title        Human basic fibroblast growth factor: nucleotide sequence,
genomic organization, and expression in mammalian cells.
#cross-references MUID:87217066
#accession    B32878
#molecule_type mRNA
#residues     56-210 #label ABR
#note         the authors translated the codon GAA for residue 108 as
Gly
REFERENCE      S00297
#authors      Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Friedman,
J.; Gospodarowicz, D.; Fiddes, J.C.
#journal      EMBO J. (1986) 5:2523-2528
#title        Human basic fibroblast growth factor: nucleotide sequence and
genomic organization.
#cross-references MUID:87053817
#accession    S00297
#status       not compared with conceptual translation
#molecule_type DNA
#residues     1-155 #label AB2
#note         the authors translated the codon GAA for residue 108 as
Gly
REFERENCE      A54316
#authors      Shimoyama, Y.; Gotoh, M.; Ino, Y.; Sakamoto, M.; Kato, K.;
Hirohashi, S.
#journal      Jpn. J. Cancer Res. (1991) 82:1263-1270
#title        Characterization of high-molecular-mass forms of basic
fibroblast growth factor produced by hepatocellular
carcinoma cells: possible involvement of basic fibroblast
growth factor in hepatocarcinogenesis.
#cross-references MUID:92091228
#accession    A54316
#molecule_type protein
#residues     'XX',86-88,'X',90-91,'X',93-95 #label SH3
#experimental_source C-Li21 hepatocellular carcinoma cell line
#note         sequence extracted from NCBI backbone (NCBIP:71595)
#accession    B54316
#molecule_type protein
#residues     'XX',19,'X',21-29 #label SH2
#note         sequence extracted from NCBI backbone (NCBIP:71594)
REFERENCE      A33624
#authors      Feige, J.J.; Bradley, J.D.; Fryburg, K.; Farris, J.; Cousens,
J.C.; Barr, P.J.; Baird, A.
#journal      J. Cell Biol. (1989) 109:3105-3114
#title        Differential effects of heparin, fibronectin, and laminin on
the phosphorylation of basic fibroblast growth factor by
protein kinase C and the catalytic subunit of protein
kinase A.
#cross-references MUID:90078343
#accession    A33624
#status       preliminary
#molecule_type protein
#residues     57-210 #label FEI
REFERENCE      A25824
#authors      Story, M.T.; Esch, F.; Shimasaki, S.; Sasse, J.; Jacobs,
S.C.; Lawson, R.K.
#journal      Biochem. Biophys. Res. Commun. (1987) 142:702-709
#title        Amino-terminal sequence of a large form of basic fibroblast
growth factor isolated from human benign prostatic
hyperplastic tissue.

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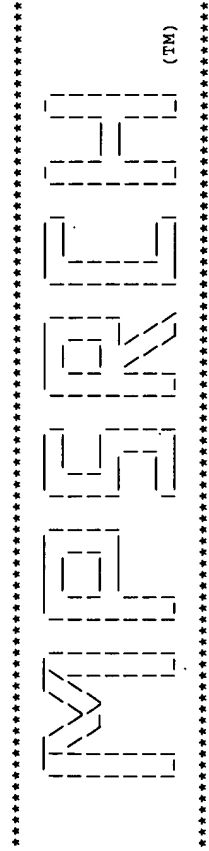
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REFERENCE
A90122
#authors GImenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal Biochem. Biophys. Res. Commun. (1986) 135:541-548
#title Human brain-derived acidic and basic fibroblast growth
factors: amino terminal sequences and specific mitogenic
activities.
#cross-references MUID:86186784
#accession B24243
#molecule_type protein
#residues 65-102,'X',104-105 #label GIM
#experimental_source brain
REFERENCE
A91364
#authors Gautschi, P.; Prater-Schroder, M.; Bohlen, P.
#journal FEBS Lett. (1986) 204:203-207
#title Partial molecular characterization of endothelial cell
mitogens from human brain: acidic and basic fibroblast
growth factors.
#cross-references MUID:86275260
#accession B24301
#molecule_type protein
#residues 65-88,'X',90-98,'X',100 #label GAU
REFERENCE
S42242
#authors Sommer, A.; Brewer, M.T.; Thompson, R.C.; Moscatelli, D.;
Presta, A.; Rifkin, D.B.
#journal Biochem. Biophys. Res. Commun. (1987) 144:543-550
#title A form of human basic fibroblast growth factor with an
extended amino terminus.
#cross-references MUID:87213238
#accession S42242
#status preliminary
#molecule_type mRNA
#residues 54-210 #label SOM
#cross-references EMBL:M17599; NID:g183086; PIDN:AAA52534.1;
PID:g183087
REFERENCE
A55784
#authors Pantoliano, M.W.; Horlick, R.A.; Springer, B.A.; Van Dyk,
D.E.; Tobery, T.; Wetmore, D.R.; Lear, J.D.; Nahapetian,
A.T.; Bradley, J.D.; Sisk, W.P.
#journal Biochemistry (1994) 33:10229-10248
#title Multivalent ligand-receptor binding interactions in the
fibroblast growth factor system produce a cooperative
growth factor and heparin mechanism for receptor
dimerization.
#cross-references MUID:94347757
#accession B55784
#molecule_type protein
#residues 54-71 #label PAN
REFERENCE
I52267
#authors Watson, R.; Anthony, F.; Pickett, M.; Lambden, P.; Masson,
G.M.; Thomas, E.J.
#journal Biochem. Biophys. Res. Commun. (1992) 187:1227-1231
#title Reverse transcription with nested polymerase chain reaction
shows transposition of basic fibroblast growth factor
transcripts in human granulosa and cumulus cells from in
vitro fertilisation patients.
#cross-references MUID:93038590
#accession I52267
#status preliminary; translated from GB/EMBL/DBJ
#molecule_type mRNA
#residues 95-182 #label RES
#cross-references GB:S47380; NID:g256535
#experimental_source granulosa cells
REFERENCE
S46253
#authors Patry, V.; Bugler, B.; Amalric, F.; Prome, J.C.; Prats, H.
#journal FEBS Lett. (1994) 349:23-28
#title Purification and characterization of the 210-amino acid
recombinant basic fibroblast growth factor form (FGF-2).
#cross-references MUID:94320639

#accession S46253
#molecule_type protein
#residues 39-53;65-88 #label PAT
#note recombinant gene expressed in Escherichia coli
GENETICS
#gene GDB:FGF2; FGFB
#cross-references GDB:119910; OMIM:134920
#map_position 4q25-4q27
#start_codon CTG
CLASSIFICATION
#superfamily fibroblast growth factor
KEYWORDS
#alternative initiators; angiogenesis; growth factor; heparin
binding; mitogen
FEATURE
1-210
#product basic fibroblast growth factor, 22.5K form
#status predicted #label MA2\
65-210
#product basic fibroblast growth factor, 18K form
#status predicted #label MAT\
82-86
#region heparin binding #status predicted\
171-174
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SUMMARY
#length 210 #molecular-weight 22623 #checksum 3610
Query Match 35.7%; Score 462; DB 2; Length 210;
Best Local Similarity 48.7%; Pred. No. 4.00e-76;
Matches 75; Conservative 30; Mismatches 42; Indels 7; Gaps 2;
Db 64 LPALPEDGGSGAAPPCKPKRLYCKNGGFLRHPDGRVDGVREKSDPHKLQQAEE 123
QY 26 VPSAGARANGTLLDANYKKPKLLYCSNGGHFLRILPDGTVDGTRDSRQHLQLSAES 85
Db 124 RGWSIKGVANRYLAMKEDGRLKSKVTCDEFFERLESN-----NYNTYRSRYT-- 176
QY 86 VGEVYIKSTETGOYLANDTDGLLYGSQTPNEECFLERLEENATPAPHYNTYISKHAEK 145
Db 177 SNYVALKRTGOYKLGSKTGPQKAILFLPMSAKS 210
QY 146 NMFVGLKKNCKGRGPRTHYQKAILFLPLPVSS 179
RESULT 13
ENTRY A31674 #type complete
TITLE Basic fibroblast growth factor precursor - rat
ALTERNATE_NAMES bFGF
ORGANISM #formal_name Rattus norvegicus #common_name Norway rat
DATE 21-May-1990 #sequence_revision 21-May-1990 #text_change
16-Jul-1999
ACCESSIONS A31674; S00876; S24309
REFERENCE A31674
#authors Shimasaki, S.; Emoto, N.; Koba, A.; Mercado, M.; Shibata, F.;
Cooksey, K.; Baird, A.; Ling, N.
#journal Biochem. Biophys. Res. Commun. (1988) 157:256-263
#title Complementary DNA cloning and sequencing of rat ov-rian basic
fibroblast growth factor and tissue distribution study of
its mRNA.
#cross-references MUID:89061721
#accession A31674
#molecule_type mRNA
#residues 1-154 #label SHI
#cross-references GB:M22427; NID:g204285; PIDN:AAA41210.1; PID:g204286
REFERENCE S00876
#authors Kurokawa, T.; Seno, M.; Igarashi, K.
#journal Nucleic Acids Res. (1988) 16:5201
#title Nucleotide sequence of rat basic fibroblast growth factor
cDNA.
#cross-references MUID:88262516
#accession S00876
#molecule_type mRNA
#residues 1-154 #label KUR
#cross-references EMBL:X07285; NID:g56203; PIDN:CAA30265.1; PID:g56204
REFERENCE S24309
#authors El-Husseini, A.E.D.; Paterson, J.A.; Myal, Y.; Shiu, R.P.C.
#journal Biochem. Biophys. Res. Commun. (1992) 113:314-316
#title PCR detection of the rat brain basic fibroblast growth factor
(bFGF) mRNA containing a unique 3' untranslated region.

```





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MPsrch\_pp protein - protein database search, using Smith-Waterman algorithm

On: Tue Aug 29 16:14:14 2000; Maspar time 7.30 seconds  
764.304 Million cell updates/sec

\*\*\*\*\*  
Circular output not generated.

Title: >US-09-121-017B-29  
Description: (1-180) from US09121017B.pep  
Perfect Score: 1294  
Sequence: 1 MSRGAGRVQCTLQALVFLGV.....PRTHYGKAILFLPLPVSSD 180

Scoring table: PAM 150  
Gap 11

Searched: 85661 seqs, 30989116 residues

Post-processing: Minimum Match 0%  
Listing first 45 summaries

Database: swiss-prot38  
1:swissprot

Statistics: Mean 44.269; Variance 68.487; scale 0.646

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Description	Pred. No.
1	931	71.9	HEPARIN-BINDING GROWTH	2.70e-209
2	914	70.6	HEPARIN-BINDING GROWTH	9.62e-205
3	911	70.4	HEPARIN-BINDING GROWTH	6.11e-204
4	900	69.6	HEPARIN-BINDING GROWTH	5.35e-201
5	862	66.6	HEPARIN-BINDING GROWTH	7.58e-191
6	861	66.5	HEPARIN-BINDING GROWTH	1.40e-190
7	475	36.7	HEPARIN-BINDING GROWTH	2.45e-89
8	469	36.2	HEPARIN-BINDING GROWTH	8.36e-88
9	463	35.8	HEPARIN-BINDING GROWTH	2.83e-86
10	462	35.7	HEPARIN-BINDING GROWTH	5.10e-86
11	458	35.4	HEPARIN-BINDING GROWTH	5.33e-85
12	453	35.0	HEPARIN-BINDING GROWTH	9.97e-84
13	450	34.8	HEPARIN-BINDING GROWTH	5.78e-83
14	438	33.8	HEPARIN-BINDING GROWTH	6.42e-80
15	418	32.3	HEPARIN-BINDING GROWTH	7.30e-75
16	327	25.3	GLIA-ACTIVATING FACTOR	3.01e-52
17	316	24.4	GLIA-ACTIVATING FACTOR	1.44e-49
18	316	24.4	GLIA-ACTIVATING FACTOR	1.44e-49
19	316	24.4	GLIA-ACTIVATING FACTOR	1.44e-49
20	298	23.0	FIBROBLAST GROWTH FACT	3.23e-45
21	293	22.6	FIBROBLAST GROWTH FACT	5.17e-44
22	280	21.6	FIBROBLAST GROWTH FACT	6.64e-41
23	260	20.1	FIBROBLAST GROWTH FACT	3.58e-36

ALIGNMENTS

RESULT	ID	FGF1_HUMAN	STANDARD;	PRT;	155 AA.
AC	P05230;	P07502;			
DT	13-AUG-1987	(Rel. 05, Created)			
DT	13-AUG-1987	(Rel. 05, Last sequence update)			
DT	15-JUL-1999	(Rel. 38, Last annotation update)			
DE	HEPARIN-BINDING GROWTH FACTOR 1	PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF) (BETA-ENDOTHELIAL CELL GROWTH FACTOR) (ECGF-BETA)			
DE	HEPARIN-BINDING GROWTH FACTOR 1	PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF) (BETA-ENDOTHELIAL CELL GROWTH FACTOR) (ECGF-BETA)			
GN	FGF1 OR FGFA.				
OS	Homo sapiens (Human).				
OC	Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Primates; Catarrhini; Homnidae; Homo.				
OC	Mammalia; Eutheria; Primates; Catarrhini; Homnidae; Homo.				
RN	[1]				
RP	SEQUENCE FROM N.A.				
RP	MEDLINE; 86261805.				
RA	Jaye M., Howk R., Burgess W., Ricca G.A., Chiu I.-M., Ravera M.W., O'Brien S.J., Modi W.S., Maciag T., Drohan W.N.;				
RA	"Human endothelial cell growth factor: cloning, nucleotide sequence, and chromosome localization.";				
RT	Science 233:541-545(1986).				
RL	[2]				
RP	SEQUENCE FROM N.A.				
RP	TISSUE-BRAIN STEM;				
RC	MEDLINE; 89343957.				
RA	Wang W.P., Lehtoma K., Varban M.L., Krishnan I., Chiu I.M.;				
RT	"Cloning of the gene coding for human class I heparin-binding growth factor and its expression in fetal tissues.";				
RL	Mol. Cell. Biol. 9:2387-2395(1989).				
RN	[3]				
RP	SEQUENCE FROM N.A.				
RP	TISSUE-BRAIN STEM;				
RC	MEDLINE; 90265618.				
RA	Chiu I.M., Wang W.P., Lehtoma K.;				
RT	"Alternative splicing generates two forms of mRNA coding for human heparin-binding growth factor 1.";				
RL	Oncogene 5:755-762(1990).				
RN	[4]				
RP	SEQUENCE FROM N.A.				
RP	MEDLINE; 90073637.				
RA	Mergia A., Fischer E., Graves D., Tumolo A., Miller J., Gospodarowicz D., Abraham J.A., Shipley G.D., Fiddes J.C.;				
RT	"Structural analysis of the gene for human acidic fibroblast growth factor.";				
RL	Biochem. Biophys. Res. Commun. 164:1121-1129(1989).				
RN	[5]				
RP	SEQUENCE FROM N.A.				

RX MEDLINE; 92019819.  
RA Wang W.P., Quick D., Balcerzak S.P., Needleman S.W., Chiu I.M.;  
RT "Cloning and sequence analysis of the human acidic fibroblast growth  
RT factor gene and its preservation in leukemia patients.";  
RN Oncogene 6:1521-1529(1991).  
RX  
RP SEQUENCE FROM N.A.  
RX MEDLINE; 92202857.  
RA Li Y.L., Kha H., Golden J.A., Migchielsen A.A.J., Goetzl E.J.,  
RA Turk E.J.;  
RT "An acidic fibroblast growth factor protein generated by alternate  
RT splicing acts like an antagonist.";  
RL J. Exp. Med. 175:1073-1080(1992).  
RX  
RP SEQUENCE OF 1-154 FROM N.A.  
RX MEDLINE; 94069734.  
RA Zhao X.M., Yeoh T.K., Hiebert M., Frist W.H., Miller G.G.;  
RT "The expression of acidic fibroblast growth factor (heparin-binding  
RT growth factor-1) and cytokine genes in human cardiac allografts and T  
RT cells.";  
RN Transplantation 56:1177-1182(1993).  
RX  
RP SEQUENCE OF 1-40 FROM N.A.  
RX MEDLINE; 90365758.  
RA Crumley G., Dionne C.A., Jaye M.;  
RT "The gene for human acidic fibroblast growth factor encodes two  
RT upstream exons alternatively spliced to the first coding exon.";  
RL Biochem. Biophys. Res. Commun. 171:7-13(1990).  
RX  
RP SEQUENCE OF 16-155.  
RX MEDLINE; 86295741.  
RA Harper J.W., Strydom D.J., Lobb R.R.;  
RT "Human class I heparin-binding growth factor: structure and homology  
RT to bovine acidic brain fibroblast growth factor.";  
RL Biochemistry 25:4097-4103(1986).  
RX  
RP SEQUENCE OF 16-155.  
RX MEDLINE; 86295741.  
RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;  
RT "The complete amino acid sequence of human brain-derived acidic  
RT fibroblast growth factor.";  
RL Biochem. Biophys. Res. Commun. 138:611-617(1986).  
RX  
RP SEQUENCE OF 16-155.  
RX MEDLINE; 87048871.  
RA Gautschi-Sova P., Mueller T., Boehlen P.;  
RT "Amino acid sequence of human acidic fibroblast growth factor.";  
RL Biochem. Biophys. Res. Commun. 140:874-880(1986).  
RX  
RP SEQUENCE OF 16-47.  
RX MEDLINE; 86186784.  
RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;  
RT "Human brain-derived acidic and basic fibroblast growth factors:  
RT amino terminal sequences and specific mitogenic activities.";  
RL Biochem. Biophys. Res. Commun. 135:541-548(1986).  
RX  
RP SEQUENCE OF 16-49.  
RX MEDLINE; 86275260.  
RA Gautschi P., Frater-Schroeder M., Boehlen P.;  
RT "Partial molecular characterization of endothelial cell mitogens from  
RT human brain: acidic and basic fibroblast growth factors.";  
RL FEBS Lett. 204:203-207(1986).  
RX  
RP X-RAY CRYSTALLOGRAPHY (2.0 ANGSTROMS).  
RX MEDLINE; 96194129.  
RA Blaber M., Disalvo J., Thomas K.A.;  
RT "X-ray crystal structure of human acidic fibroblast growth factor.";  
RL Biochemistry 35:2086-2094(1996).  
RX  
RP STRUCTURE BY NMR OF 24-155.  
RX MEDLINE; 94355885.  
RA Pineda-Lucena A., Jimenez M.A., Nieto J.L., Santoro J., Rico M.,  
RA Gimenez-Gallego G.;

RT "1H-NMR assignment and solution structure of human acidic fibroblast  
RT growth factor activated by inositol hexasulfate.";  
RL J. Mol. Biol. 242:81-98(1994).  
RX  
RP STRUCTURE BY NMR OF 24-155.  
RX MEDLINE; 97107535.  
RA Pineda-Lucena A., Jimenez M.A., Lozano R.M., Nieto J.L., Santoro J.,  
RA Rico M., Gimenez-Gallego G.;  
RT "Three-dimensional structure of acidic fibroblast growth factor in  
RT solution: effects of binding to a heparin functional analog.";  
RL J. Mol. Biol. 264:162-178(1996).  
RX  
RP STRUCTURE BY NMR OF 25-155.  
RX MEDLINE; 98387896.  
RA Lozano R.M., Jimenez M., Santoro J., Rico M., Gimenez-Gallego G.;  
RT "Solution structure of acidic fibroblast growth factor bound to 1,3,  
RT 6-naphthalenetrifluoromethyl sulfonate: a minimal model for the anti-tumoral  
RT action of suramin and suradistas.";  
RL J. Mol. Biol. 281:899-915(1998).  
CC  
CC !- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC  
CC !- SUBUNIT: MONOMER.  
CC  
CC !- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY  
CC THAN DOES BFGF.  
CC  
CC !- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
CC  
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CC or send an email to [license@isb-sib.ch](mailto:license@isb-sib.ch)).  
CC  
CC EMBL; M13361; AAA79245.1; -  
CC EMBL; X51943; CAA36206.1; -  
CC EMBL; M30492; AAA52446.1; -  
CC EMBL; M30490; AAA52446.1; JOINED.  
CC EMBL; M30491; AAA52446.1; JOINED.  
CC EMBL; M60515; AAA51672.1; -  
CC EMBL; M60516; AAA51673.1; -  
CC EMBL; M23087; AAA52638.1; -  
CC EMBL; M23086; AAA52638.1; JOINED.  
CC EMBL; S67291; AAB29057.1; -  
CC EMBL; X65778; CAA46661.1; -  
CC PIR; A23553; A23553.  
CC PIR; A24243; A24243.  
CC PIR; A24301; A24301.  
CC PIR; A24682; A24682.  
CC PIR; A24820; A24820.  
CC PIR; A26386; A26386.  
CC PIR; A33665; A33665.  
CC PIR; S18217; S18217.  
CC PDB; 2AFG; 15-OCT-95.  
CC PDB; 1AXM; 22-APR-98.  
CC PDB; 2AXM; 22-APR-98.  
CC PDB; 1RML; 11-NOV-98.  
CC MIM; 131220; -  
CC PFAM; PF00167; FGF; 1.  
CC PRINTS; PR00262; ILIHGCF.  
CC PRINTS; PR00263; HBGFHGF.  
CC PROSITE; PS00247; HBGF\_FGF; 1.  
KW Growth factor; Mitogen; Vascularization; Heparin-binding; Acetylation;  
KW 3D-structure.  
FT PROPEP 1 15 HEPARIN-BINDING GROWTH FACTOR 1.  
FT CHAIN 16 155 ACETYLATION  
FT MOD\_RES 2 2 HEPARIN (POTENTIAL).  
FT BINDING 24 28 HEPARIN (POTENTIAL).  
FT BINDING 113 116 HEPARIN (POTENTIAL).  
FT SEQUENCE 155 AA; 17460 MW; F586E8BF09F1580 CRC64;  
SQ



Query Match 71.9%; Score 931; DB 1; Length 155;  
Best Local Similarity 94.4%; Pred. No. 2.70e-209;  
Matches 135; Conservative 1; Mismatches 2; Indels 5; Gaps 1;

Db 18 LPPGNYKKLLKLLYCSNGGHLRLPDLPGTVDGTRDSQHIQLQLSAESGVEYIKSTGTG 77  
| : |||||  
QY 38 LLDANYKKPKLLYCSNGGHLRLPDLPGTVDGTRDSQHIQLQLSAESGVEYIKSTGTG 97  
| : |||||  
Db 78 QYLANDTDGLLYGSQTPNEECFLERLEEN-----HYNTYSKKHAENKWNFVGLKKNKSG 132  
| : |||||  
QY 98 QYLANDTDGLLYGSQTPNEECFLERLEENATPAPHNTYIISKHAENKWNFVGLKKNKSG 157  
| : |||||  
Db 133 KRGPRTHYGOKAILFLPLPVSSD 155  
| : |||||  
QY 158 KRGPRTHYGOKAILFLPLPVSSD 180  
| : |||||

RESULT 2  
ID FGFL\_MESAU STANDARD; PRT: 155 AA.  
AC P34004;  
DT 01-FEB-1994 (Rel. 28, Created)  
DT 01-FEB-1994 (Rel. 28, Last sequence update)  
DT 15-JUL-1999 (Rel. 38, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF).  
DE GROWTH FACTOR (AFGF).  
GN FGFL OR FGF-1.  
OS Mesocricetus auratus (Golden hamster).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Cricetinae;  
OC Mesocricetus.  
RN [1]  
RP SEQUENCE FROM N.A.  
RX MEDLINE; 90270291.  
RA Hall J.A., Harris M.A., Malark M., Mansson P.E., Zhou H., Harris S.E.;  
RT "Characterization of the hamster DDT-1 cell aFGF/HBGF-1 gene and cDNA and its modulation by steroids.";  
RT J. Cell. Biochem. 43:17-26(1990).  
CC [1] FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC [1] SUBUNIT: MONOMER.  
CC [1] MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY THAN DOES BFGF.  
CC [1] SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
DR PIR; A60721; A60721.  
DR HSP; P05230; 2AXM.  
DR PFAM; PF00167; FGF; 1.  
DR PRINTS; PR00262; ILIHBGF.  
DR PRINTS; PR00263; HBGFPGF.  
DR PROSITE; PS00247; HBGF\_FGF; 1.  
KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
FT PROPEP 1 15 BY SIMILARITY.  
FT CHAIN 16 155 HEPARIN-BINDING GROWTH FACTOR 1.  
FT BINDING 24 28 HEPARIN (POTENTIAL).  
FT BINDING 113 116 HEPARIN (POTENTIAL).  
SQ SEQUENCE 155 AA; 17403 MW; 41E5EC760E412CC5 CRC64;

Query Match 70.6%; Score 914; DB 1; Length 155;  
Best Local Similarity 92.3%; Pred. No. 9.62e-205;  
Matches 132; Conservative 2; Mismatches 4; Indels 5; Gaps 1;

Db 18 LPPGNYKKLLKLLYCSNGGHLRLPDLPGTVDGTRDSQHIQLQLSAESGVEYIKSTGTG 77  
| : |||||  
QY 38 LLDANYKKPKLLYCSNGGHLRLPDLPGTVDGTRDSQHIQLQLSAESGVEYIKSTGTG 97  
| : |||||  
Db 78 QYLANDTDGLLYGSQTPNEECFLERLEEN-----HYNTYSKKHAENKWNFVGLKKNKSG 132  
| : |||||  
QY 98 QYLANDTDGLLYGSQTPNEECFLERLEENATPAPHNTYIISKHAENKWNFVGLKKNKSG 157  
| : |||||  
Db 133 KRGPRTHYGOKAILFLPLPVSSD 155  
| : |||||  
QY 158 KRGPRTHYGOKAILFLPLPVSSD 180  
| : |||||

RESULT 3  
ID FGFL\_MOUSE STANDARD; PRT: 155 AA.  
AC P10935;  
DT 01-JUL-1989 (Rel. 11, Created)  
DT 01-JUL-1989 (Rel. 11, Last sequence update)  
DT 15-JUL-1999 (Rel. 38, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF).  
GN FGFL OR FGF-1 OR FGFA.  
OS Mus musculus (Mouse).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.  
RN [1]  
RP SEQUENCE FROM N.A.  
RX SPECIES-RAT;  
RX MEDLINE; 89240051.  
RA Goodrich S., Yan G.C., Bahrenburg K., Mansson P.E.;  
RT "The nucleotide sequence of rat heparin binding growth factor 1 (HBGF-1).";  
RT Nucleic Acids Res. 17:2867-2867(1989).  
RN [2]  
RP SEQUENCE FROM N.A.  
RX SPECIES-MOUSE;  
RX MEDLINE; 90201563.  
RA Hebert J.M., Basilico C., Goldfarb M., Haub O., Martin G.R.;  
RT "Isolation of cDNAs encoding four mouse FGF family members and characterization of their expression patterns during embryogenesis.";  
RT Dev. Biol. 138:454-463(1990).  
RN [3]  
RP SEQUENCE FROM N.A.  
RX SPECIES-MOUSE;  
RX MEDLINE; 97128312.  
RA Madial F., Hackshaw K.V., Chiu I.M.;  
RT "Cloning and characterization of the mouse Fgf-1 gene.";  
RT Gene 179:231-236(1996).  
RN [4]  
RP SEQUENCE FROM N.A.  
RX SPECIES-MOUSE; STRAIN=BALB/C;  
RX MEDLINE; 97094746.  
RA Alam K.Y., Frosthalm A., Hackshaw K.V., Evans J.E., Rotter A., Chiu I.M.;  
RT "Characterization of the 1B promoter of fibroblast growth factor 1 and its expression in the adult and developing mouse brain.";  
RL J. Biol. Chem. 271:30263-30271(1996).  
CC [1] FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC [1] SUBUNIT: MONOMER.  
CC [1] SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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DR EMBL; X14232; CAA32448.1;  
DR EMBL; M30641; AAA37618.1;  
DR EMBL; U36459; AAC52969.1;  
DR EMBL; U36457; AAC52969.1; JOINED.  
DR EMBL; U36458; AAC52969.1; JOINED.  
DR EMBL; U67610; AAC52907.1;  
DR PIR; S04147; S04147.  
DR PIR; D37360; D37360.  
DR HSSP; P05230; 2AXM.  
DR MGD; MGI:95515; FGFL.  
DR PFAM; PF00167; FGF; 1.  
DR PRINTS; PR00262; ILIHBGF.

DR PRINTS; PR00263; HBGFFGF.  
 DR PROSITE; PS00247; HBGFFGF; 1.  
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
 FT PROPEP 1 15  
 FT CHAIN 16 155 HEPARIN-BINDING GROWTH FACTOR 1.  
 FT BINDING 24 28 HEPARIN (POTENTIAL).  
 FT BINDING 113 116 HEPARIN (POTENTIAL).  
 SQ SEQUENCE 155 AA; 17418 MW; 8880E4FF0FBA4161 CRC64;

Query Match 70.48; Score 911; DB 1; Length 155;  
 Best Local Similarity 92.98; Pred. No. 6.11e-204;  
 Matches 130; Conservative 3; Mismatches 2; Indels 5; Gaps 1;

Db 21 GNTKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTGQYL 80  
 QY 41 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTGQYL 100  
 Db 81 AMDTGGLYSGQTPNECLFLERLEEN-----HYNTYTSKKHAEKNWFVGLKNGSKRG 135  
 101 AMDTGGLYSGQTPNECLFLERLEENATPAPHYNTYISKHAEKNWFVGLKNGSKRG 160  
 Db 136 PRTHYGOKAILFLPLPVSSD 155  
 QY 161 PRTHYGOKAILFLPLPVSSD 180

RESULT 4  
 ID FGF1\_PIG STANDARD; PRT; 152 AA.  
 AC P20002;  
 DT 01-FEB-1991 (Rel. 17, Created)  
 DT 01-FEB-1996 (Rel. 33, Last sequence update)  
 DT 15-JUL-1999 (Rel. 38, Last annotation update)  
 DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF) (ALPHA-ENDOTHELIAL CELL GROWTH FACTOR) (FRAGMENT).  
 DE FGF1 OR FGF-1.  
 GN Sus scrofa (Pig).  
 OS Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Cetartiodactyla; Suina; Suidae; Sus.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RC TISSUE-HEART;  
 RX Schmidt M., Sharma H.S., Schott R.J., Schaper W.;  
 RA "Amplification and sequencing of mRNA encoding acidic fibroblast growth factor (aFGF) from porcine heart".  
 RT Biochem. Biophys. Res. Commun. 180:853-859(1991).  
 RL [2]  
 RN SEQUENCE OF 22-41.  
 RC MEDLINE; 89231704.  
 RA Quinkler W., Maasberg M., Bernotat-Danielowski S., Luethe N.,  
 RA Sharma H.S., Schaper W.;  
 RT "Isolation of heparin-binding growth factors from bovine, porcine and canine hearts".  
 RL Eur. J. Biochem. 181:67-73(1989).  
 CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.  
 CC -1- SUBUNIT: MONOMER.  
 CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY THAN DOES BFGF.  
 CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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 CC EMBL; X60317; CAA42869.1; -

DR PIR; S03954; S03954.  
 DR HSSP; P05230; 2AXM.  
 DR PFAM; PF00167; FGF; 1.  
 DR PROSITE; PS00247; HBGFFGF; 1.  
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
 FT PROPEP 1 15  
 FT CHAIN 16 >152 HEPARIN-BINDING GROWTH FACTOR 1.  
 FT BINDING 22 >152 ENDOTHELIAL CELL GROWTH FACTOR ALPHA.  
 FT BINDING 24 28 HEPARIN (POTENTIAL).  
 FT BINDING 113 116 HEPARIN (POTENTIAL).  
 FT CONFLICT 31 31 C -> S (IN REF. 2).  
 FT CONFLICT 39 39 R -> Y (IN REF. 2).  
 FT NON\_TER 152  
 SQ SEQUENCE 152 AA; 17103 MW; AE853B0A92F9ABF4 CRC64;

Query Match 69.68; Score 900; DB 1; Length 152;  
 Best Local Similarity 92.18; Pred. No. 5.35e-201;  
 Matches 129; Conservative 2; Mismatches 4; Indels 5; Gaps 1;

Db 18 LPPGNVKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTG 77  
 QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTG 97  
 Db 78 QYIAMDTGGLYSGQTPNECLFLERLEEN-----HYNTYTSKKHAEKNWFVGLKNGSK 132  
 QY 98 QYIAMDTGGLYSGQTPNECLFLERLEENATPAPHYNTYISKHAEKNWFVGLKNGSK 157  
 Db 133 KRGPRTHYGOKAILFLPLPV 152  
 QY 158 KRGPRTHYGOKAILFLPLPV 177

RESULT 5  
 ID FGF1\_BOVIN STANDARD; PRT; 155 AA.  
 AC P03968;  
 DT 23-OCT-1986 (Rel. 02, Created)  
 DT 01-MAR-1989 (Rel. 10, Last sequence update)  
 DT 15-JUL-1999 (Rel. 38, Last annotation update)  
 DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF) (PROSTATROPIN) (ENDOTHELIAL CELL GROWTH FACTOR BETA AND ALPHA CHAINS) (ACIDIC EYE-DERIVED GROWTH FACTOR II) (EDGF II).  
 DE FGF1 OR FGF-1 OR FGFA OR HBGF-1 OR AFGF.  
 OS Bos taurus (Bovine).  
 OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;  
 OC Bovidae; Bovinae; Bos.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RC TISSUE-RETINA;  
 RX MEDLINE; 89083506  
 RA Halley C., Courtois Y., Laurent M.;  
 RT "Nucleotide sequence of bovine acidic fibroblast growth factor cDNA.";  
 RL Nucleic Acids Res. 16:10913-10913(1988).  
 RN [2]  
 RP SEQUENCE FROM N.A.  
 RC TISSUE-RETINA;  
 RX MEDLINE; 89078619.  
 RA Alterio J., Halley C., Brou C., Soussi T., Courtois Y., Laurent M.;  
 RT "Characterization of a bovine acidic FGF cDNA clone and its expression in brain and retina".  
 RL FEBS Lett. 242:41-46(1988).  
 RN [3]  
 RP SEQUENCE OF 2-155.  
 RX MEDLINE; 87018918.  
 RA Burgess W.H., Mehlman T., Marshak D.R., Fraser B.A., Maciag T.;  
 RT "Structural evidence that endothelial cell growth factor beta is the precursor of both endothelial cell growth factor alpha and acidic fibroblast growth factor".  
 RL Proc. Natl. Acad. Sci. U.S.A. 83:7216-7220(1986).  
 RN [4]  
 RP SEQUENCE OF 2-155.  
 RX MEDLINE; 87026586.

RA Crabb J.W., Ames L.G., Carr S.A., Johnson C.M., Roberts G.D.,  
 RA Bordoli R.S., McKeenhan W.L.;  
 RT "Complete primary structure of prostotropin, a prostate epithelial  
 RL cell growth factor.";  
 RN Biochemistry 25:4988-4993(1986).  
 RP [5]  
 RP SEQUENCE OF 16-155.  
 RX MEDLINE: 86070224.  
 RA Gimenez-Gallego G., Rodkey J., Bennett C., Rios-Candelore M.,  
 RA Disalvo J., Thomas K.;  
 RT "Brain-derived acidic fibroblast growth factor: complete amino acid  
 RT sequence and homologies.";  
 RL Science 230:1385-1388(1985).  
 RN [6]  
 RP SEQUENCE OF 16-44, AND COMPOSITION.  
 RX MEDLINE: 86055750.  
 RA Boehlen P., Esch F., Baird A., Gospodarowicz D.;  
 RT "Acidic fibroblast growth factor (FGF) from bovine brain:  
 RT amino-terminal sequence and comparison with basic FGF.";  
 RN EMBO J. 4:1951-1956(1985).  
 RP [7]  
 RP SEQUENCE OF 16-56 FROM N.A.  
 RX MEDLINE: 86261806.  
 RA Abraham J.A., Mergia A., Whang J.L., Tumolo A., Friedman J.,  
 RA Hjerrild K.A., Gospodarowicz D., Fiddes J.C.;  
 RT "Nucleotide sequence of a bovine clone encoding the angiogenic  
 RT protein, basic fibroblast growth factor.";  
 RN Science 233:545-548(1986).  
 RP [8]  
 RP SEQUENCE OF 16-45.  
 RX MEDLINE: 89231704.  
 RA Quinkler W., Maasberg M., Bernotat-Danielowski S., Luethke N.,  
 RA Sharma H.S., Schaper W.;  
 RT "Isolation of heparin-binding growth factors from bovine, porcine and  
 RT canine hearts.";  
 RL Eur. J. Biochem. 181:67-73(1989).  
 RN [9]  
 RP SEQUENCE OF 1-18 FROM N.A.  
 RA Philippe J.M., Renaud F., Desset S., Laurent M.;  
 RL Submitted (JUL-1992) to the EMBL/GenBank/DBJ databases.  
 RN [10]  
 RP X-RAY CRYSTALLOGRAPHY (3.0 ANGSTROMS).  
 RX MEDLINE: 91095983.  
 RA Zhu X., Komiya H., Chirino A., Faham S., Fox G.M., Arakawa T.,  
 RA Hsu B.T., Rees D.C.;  
 RT "Three-dimensional structures of acidic and basic fibroblast growth  
 RT factors.";  
 RL Science 251:90-93(1991).  
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
 CC -!- SUBUNIT: MONOMER.  
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY  
 CC THAN DOES BFGF.  
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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 CC EMBL: M13439; AAA30516.1;  
 DR EMBL: X13221; CAA31610.1;  
 DR EMBL: X14032; CAA32192.1;  
 DR EMBL: M35608; AAA30517.1;  
 DR EMBL: X66446; CAA47063.1;  
 DR EMBL: M97660; AAA30563.1;  
 DR EMBL: M97661; AAA30564.1;  
 DR PIR: A01385; GRBOA.

DR PIR: A25043; A25043.  
 DR PIR: B25043; B25043.  
 DR PIR: C25043; C25043.  
 DR PIR: A24477; A24477.  
 DR PIR: B24663; B24663.  
 DR PIR: S02102; S02102.  
 DR PDB: 1BAR; 31-OCT-93.  
 DR PDB: 1AFC; 31-OCT-93.  
 DR PFAM: PF00167; FGF; 1.  
 DR PRINTS: PR00262; ILIHBGF.  
 DR PRINTS: PR00263; HBGF-FGF.  
 DR PROSITE: PS00247; HBGF-FGF; 1.  
 KW Growth factor; Mitogen; Vascularization; Heparin-binding; Acetylation;  
 KW 3D-structure.  
 FT PROPEP 1 15  
 FT CHAIN 2 155  
 FT CHAIN 16 155  
 FT CHAIN 22 155  
 FT MOD\_RES 2 2  
 FT BINDING 24 28  
 FT BINDING 113 116  
 FT STRAND 27 31  
 FT TURN 32 34  
 FT TURN 37 40  
 FT TURN 42 43  
 FT STRAND 46 49  
 FT HELIX 55 57  
 FT STRAND 59 61  
 FT STRAND 69 69  
 FT STRAND 71 73  
 FT STRAND 79 82  
 FT TURN 84 85  
 FT STRAND 87 91  
 FT HELIX 96 98  
 FT STRAND 100 100  
 FT STRAND 103 104  
 FT TURN 106 107  
 FT STRAND 110 111  
 FT STRAND 113 114  
 FT TURN 116 121  
 FT STRAND 123 123  
 FT STRAND 126 126  
 FT TURN 128 129  
 FT STRAND 132 132  
 FT STRAND 134 134  
 FT HELIX 135 137  
 FT TURN 140 141  
 FT TURN 144 145  
 FT STRAND 147 150  
 SQ SEQUENCE 155 AA; 17493 MW; F636641F189F9BFD CRC64;  
 Query Match 66.6%; Score 862; DB 1; Length 155;  
 Best Local Similarity 88.6%; Pred. No. 7.58e-191;  
 Matches 124; Conservative 6; Mismatches 5; Indels 5; Gaps 1;  
 Db 21 GNKKPKLYCSNGVFLRILPDGTVGDKRSDQHIQQLCAESIGEVYIKSTE\*GQFL 80  
 QY 41 ANKKPKLYCSNGVFLRILPDGTVGDKRSDQHIQQLCAESIGEVYIKSTE\*GQYL 100  
 Db 81 AMDTDGLLYGSQTPNEECFLERLEEN-----HYNTYISKKAHKKHWFVGLKKN\*RSKLG 135  
 QY 101 AMDTDGLLYGSQTPNEECFLERLEENATPAPHYNTYISKKAHKKHWFVGLKKN\*SKRG 160  
 Db 136 PRTHFGQKAILFLPLPVSSD 155  
 QY 161 PRTHFGQKAILFLPLPVSSD 180  
 RESULT 6  
 ID FGF1\_CHICK STANDARD; PRT; 155 AA.  
 AC P19596;  
 DT 01-FEB-1991 (Rel. 17, Created)  
 DT 01-FEB-1996 (Rel. 33, Last sequence update)

15-JUL-1999 (Rel. 38, Last annotation update)  
HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF) (ALPHA-ENDOTHELIAL CELL GROWTH FACTOR).  
FGF1 OR FGF-1. (Chicken).

OS Gallus gallus (Chicken).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Archosauria; Aves; Neognathae; Galliformes; Phasianidae; Phasianinae;  
OC Gallus.  
[1]

SEQUENCE FROM N.A.  
MEDLINE; 91347925.

RA Schnurch H., Risau W.;  
RT "Differentiating and mature neurons express the acidic fibroblast growth factor gene during chick neural development.";  
RL Development 111:1143-1154 (1991).

[2]

SEQUENCE FROM N.A.  
Martin G.R., Han J.K.;  
Submitted (JUL-1995) to the EMBL/GenBank/DBJ databases.  
[3]

SEQUENCE OF 22-48.  
MEDLINE; 88296438.

RA Risau W., Gautschi-Sova P., Boehlen P.;  
RT "Endothelial cell growth factors in embryonic and adult chick brain are related to human acidic fibroblast growth factor.";  
RL EMBO J. 7:959-962 (1988).

CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS

CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN

CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND

CC CONCENTRATION OF THESE 2 GROWTH FACTORS.

CC -!- SUBUNIT: MONOMER.

CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY

CC THAN DOES HBGF.

CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.

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CC EMBL; S63263; AAB19629.1; -

DR EMBL; U31863; AAA80310.1; -

DR EMBL; S63261; AAD13942.1; -

DR PIR; S02639; S02639.

DR HSP; P05230; 2AXM.

DR PFAM; PF00167; FGF; 1.

PRINTS; PR00262; IL1HBGF.

PRINTS; PR00263; HBGF.FGF.

PROSITE; PS00247; HBGF\_FGF; 1.

KW Growth factor; Mitogen; Vascularization; Heparin-binding.

FT PROPEP 1 15

FT CHAIN 16 155

FT CHAIN 22 155

FT BINDING 24 28

FT BINDING 113 116

SQ SEQUENCE 155 AA; 17322 MW; 8EDB70545E2B4365 CRC64;

Query Match 66.5%; Score 861; DB 1; Length 155;

Best Local Similarity 87.1%; Pred. No. 1.40e-190;

Matches 122; Conservative 6; Mismatches 7; Indels 5; Gaps 1;

Db 21 GNYKPKLLYCSNGHFLRIIPDGKVDGTRSDQHQLQLSAEDVEVYTKSTASGOYL 80

QY 41 ANYKPKLLYCSNGHFLRIIPDGKVDGTRSDQHQLQLSAEDVEVYTKSTETGOYL 100

Db 81 AMDTNGLLYSGQPECECLFLERLEN-----HYNTYISKKHADKNFVGLKKNKSLG 135

QY 101 AMDTDGLLYGSQTNECECLFLERLENATPAPHYNTYISKKHAEKNFVGLKKNKSKRG 160

Db 136 PRTHYGOKAILFLPLPVSA 155

QY 161 PRTHYGOKAILFLPLPVSSD 180

RESULT 7

ID FGF2\_CHICK STANDARD; PRT; 158 AA.

AC P48800;

DT 01-FEB-1996 (Rel. 33, Created)

DT 01-FEB-1996 (Rel. 33, Last sequence update)

DT 01-FEB-1996 (Rel. 33, Last annotation update)

DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST

DE GROWTH FACTOR) (BFGF).

GN FGF2 OR FGF-2.

OS Gallus gallus (Chicken).

OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;

OC Archosauria; Aves; Neognathae; Galliformes; Phasianidae; Phasianinae;

OC Gallus.

RN [1]

RP SEQUENCE FROM N.A.

RX MEDLINE; 93246053.

RA Borja A.Z., Zeller R., Meijers C.;

RT "Expression of alternatively spliced bFGF first coding exons and

RT antisense mRNAs during chicken embryogenesis.";

RL Dev. Biol. 157:110-118 (1993).

CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS

CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN

CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND

CC CONCENTRATION OF THESE 2 GROWTH FACTORS.

CC -!- SUBUNIT: MONOMER.

CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES

CC AFGF.

CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.

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CC EMBL; M95707; AAA48617.1; -

DR HSP; P09038; 1BFF.

DR PFAM; PF00167; FGF; 1.

DR PRINTS; PR00262; IL1HBGF.

DR PRINTS; PR00263; HBGF.FGF.

DR PROSITE; PS00247; HBGF\_FGF; 1.

KW Growth factor; Mitogen; Vascularization; Heparin-binding.

FT PROPEP 1 12

FT CHAIN 13 158

FT BINDING 30 34

FT BINDING 119 122

SQ SEQUENCE 158 AA; 17374 MW; 7B69B684C17F1816 CRC64;

Query Match 36.7%; Score 475; DB 1; Length 158;

Best Local Similarity 48.7%; Pred. No. 2.45e-89;

Matches 75; Conservative 29; Mismatches 43; Indels 7; Gaps 2;

Db 12 LPALPDGCGGAPPPGHFKDPKRLYCKNGOFFLRINPDGRVDGVRKSDPHIKLQLOAEE 71

QY 26 VPSAGARANGTLLDANYKKPKLLYCSNGHFLRIIPDGKVDGTRSDQHQLQLSAES 85

Db 72 RGVYSIKGVSNFLAMKEDGRLLALKATECECFERLESN-----NYNTYISRKYSVSD- 125

QY 86 VGEVYIKSTGTGYLAMDTDGLLYGSQTPNECLFLERLENATPAPHYNTYISKKHAEK 145

Db 126 -WYVALKRTQYKPGPKTGPQKAILFLPMSAKS 158

QY 146 NWFVGLKKNKSKRGPRTHYGOKAILFLPLPVSS 179

RESULT 8

ID FGF2\_BOVIN STANDARD; PRT; 155 AA.

AC P03969;  
 DT 23-OCT-1986 (Rel. 02, Created)  
 DT 23-OCT-1986 (Rel. 02, Last sequence update)  
 DT 01-FEB-1996 (Rel. 33, Last annotation update)  
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST  
 DE GROWTH FACTOR) (BFGF) (PROSTATHIN) [CONTAINS: KIDNEY-DERIVED GROWTH  
 DE FACTOR].  
 GN FGF2 OR FGF-2.  
 OS Bos taurus (Bovine).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;  
 OC Bovidae; Bovinae; Bos.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 87217066.  
 RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Fiddes J.C.;  
 RA "Human basic fibroblast growth factor: nucleotide sequence, genomic  
 RA organization, and expression in mammalian cells.";  
 RL Cold Spring Harb. Symp. Quant. Biol. 51:657-668(1986).  
 RN [3]  
 RP SEQUENCE OF 10-155.  
 RX MEDLINE; 86016731.  
 RA Esch F., Baird A., Ling N., Ueno N., Hill F., Denoroy L., Klepper R.,  
 RA Gospodarowicz D., Boehlen P., Guillemin R.;  
 RT "Primary structure of bovine pituitary basic fibroblast growth factor  
 RT (FGF) and comparison with the amino-terminal sequence of bovine brain  
 RT acidic FGF.";  
 RL Proc. Natl. Acad. Sci. U.S.A. 82:6507-6511(1985).  
 RN [4]  
 RP SEQUENCE OF 1-9.  
 RX MEDLINE; 86295737.  
 RA Ueno N., Baird A., Esch F., Ling N., Guillemin R.;  
 RT "Isolation of an amino terminal extended form of basic fibroblast  
 RT growth factor.";  
 RL Biochem. Biophys. Res. Commun. 138:580-588(1986).  
 RN [5]  
 RP SEQUENCE OF 25-41.  
 RX TISSUE-KIDNEY;  
 RA Baird A., Esch F., Boehlen P., Ling N., Gospodarowicz D.;  
 RA "Isolation and partial characterization of an endothelial cell growth  
 RA factor from the bovine kidney: homology with basic fibroblast growth  
 RA factor.";  
 RL Regul. Pept. 12:201-213(1985).  
 RN [6]  
 RP SEQUENCE OF 21-40.  
 RX TISSUE-KIDNEY;  
 RA Ueno N., Baird A., Esch F., Shimasaki S., Ling N., Guillemin R.;  
 RT "Purification and partial characterization of a mitogenic factor from  
 RT bovine liver: structural homology with basic fibroblast growth  
 RT factor.";  
 RL Regul. Pept. 16:135-145(1986).  
 RN [7]  
 RP X-RAY CRYSTALLOGRAPHY (3.0 ANGSTROMS).  
 RX MEDLINE; 91095983.  
 RA Zhu X., Komiyama H., Chirino A., Faham S., Fox G.M., Arakawa T.,  
 RA Hsu B.T., Rees D.C.;  
 RT "Three-dimensional structures of acidic and basic fibroblast growth  
 RT factors.";  
 RL Science 251:90-93(1991).  
 CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.

CC -1- SUBUNIT: MONOMER.  
 CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES  
 CC AFGF.  
 CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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 CC -----  
 CC EMBL; M13440; AAA30518.1; -  
 DR PIR; A24663; GRBOB.  
 DR PIR; A24819; A24819.  
 DR PIR; A32878; A32878.  
 DR PDB; 1BAS; 31-OCT-93.  
 DR PFAM; PF00167; FGF; 1.  
 DR PRINTS; PR00262; IL1HBGF.  
 DR PRINTS; PR00263; HBGF.FGF.  
 DR PROSITE; PS00247; HBGF\_FGF; 1.  
 KW Growth factor; Mitogen; Vascularization; Heparin-binding;  
 KW 3D-structure.  
 FT PROPEP 1 9  
 FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.  
 FT CHAIN 25 155 KIDNEY-DERIVED GROWTH FACTOR.  
 FT SITE 46 48 CELL ATTACHMENT SITE (POTENTIAL).  
 FT SITE 88 90 CELL ATTACHMENT SITE (POTENTIAL).  
 FT BINDING 27 31 HEPARIN (POTENTIAL).  
 FT BINDING 116 119 HEPARIN (POTENTIAL).  
 FT STRAND 30 34  
 FT TURN 35 38  
 FT STRAND 39 43  
 FT TURN 45 46  
 FT STRAND 49 52  
 FT TURN 55 56  
 FT STRAND 58 60  
 FT HELIX 62 68  
 FT TURN 69 70  
 FT STRAND 71 76  
 FT TURN 77 80  
 FT STRAND 81 85  
 FT TURN 87 88  
 FT STRAND 91 94  
 FT HELIX 99 101  
 FT STRAND 103 107  
 FT TURN 109 110  
 FT STRAND 113 117  
 FT TURN 121 122  
 FT STRAND 124 124  
 FT STRAND 127 127  
 FT TURN 129 130  
 FT STRAND 133 133  
 FT STRAND 136 138  
 FT TURN 141 142  
 FT HELIX 144 146  
 FT STRAND 148 151  
 SQ SEQUENCE 155 AA; 17250 MW; BE6CE70FA6107129 CRC64;

Query Match 36.2%; Score 469; DB 1; Length 155;  
 Best Local Similarity 49.4%; Pred. No. 8.36e-88;  
 Matches 76; Conservative 29; Mismatches 42; Indels -; Gaps 2;  
 Db 9 LPALPEDGGGAFPPGHFKDKPKLYCKNGGFFLRHPDGRVDGVRKSDPHIK-JLQAE 68  
 Qy 26 VPSAPAGARANTGLDANVKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHLQLSAES 85  
 Db 69 RGVVISIGVCANRYLANKEGRLLASKCVTDECFFERLESN-----NYNTYRKRKYS-- 121  
 Qy 86 VGEYIKSTETGOYLAMDITDGLLYGSQTPNEECLEFLERLEENATPAPHYNTYISKHAEK 145  
 Db 122 SWYVALKRTGYKLGPKTGPQKAILFLPMSAKS 155



RA MEDLINE; 87156686.  
RA "Amino-Terminal Sequence of a Large Form of Basic Fibroblast Growth  
RT factor isolated from human benign prostatic hyperplastic tissue."  
RL Biochem. Biophys. Res. Commun. 142:702-709(1987).  
RN [9]  
RX X-RAY CRYSTALLOGRAPHY (2.2 ANGSTROMS).  
RX MEDLINE; 91195367.  
RA Eriksson A.E., Cousens L.S., Weaver L.H., Matthews B.W.;  
RT "Three-dimensional structure of human basic fibroblast growth  
RT factor."  
RN Proc. Natl. Acad. Sci. U.S.A. 88:3441-3445(1991).  
RX X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).  
RX MEDLINE; 94004464.  
RA Eriksson A.E., Cousens L.S., Matthews B.W.;  
RT "Refinement of the structure of human basic fibroblast growth factor  
RT at 1.6-A resolution and analysis of presumed heparin binding sites by  
RT selenate substitution."  
RN Protein Sci. 2:1274-1284(1993).  
RX X-RAY CRYSTALLOGRAPHY (1.8 ANGSTROMS).  
RX MEDLINE; 91195368.  
RA Zhang J., Cousens L.S., Barr P.J., Sprang S.R.;  
RT "Three-dimensional structure of human basic fibroblast growth factor,  
RT a structural homolog of interleukin 1 beta."  
RN Proc. Natl. Acad. Sci. U.S.A. 88:3446-3451(1991).  
RX X-RAY CRYSTALLOGRAPHY (1.6 ANGSTROMS).  
RX MEDLINE; 92121151.  
RA Ago H., Kitagawa Y., Fujishima A., Matsuura Y., Katsube Y.;  
RT "Crystal structure of basic fibroblast growth factor at 1.6-A  
RT resolution."  
RN J. Biochem. 110:360-363(1991).  
RX X-RAY CRYSTALLOGRAPHY (2.8 ANGSTROMS).  
RX MEDLINE; 91095983.  
RA Zhu X., Komiya H., Chirino A., Faham S., Fox G.M., Arakawa T.,  
RT "Three-dimensional structures of acidic and basic fibroblast growth  
RT factors."  
RN Science 251:90-93(1991).  
RX STRUCTURE BY NMR.  
RX MEDLINE; 97040521.  
RA Moy F.J., Seadon A.P., Boehlen P., Powers R.;  
RT "High-resolution solution structure of basic fibroblast growth factor  
RT determined by multidimensional heteronuclear magnetic resonance  
RT spectroscopy."  
RN Biochemistry 35:13552-13561(1996).  
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -!- SUBUNIT: MONOMER.  
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES  
CC AFGF.  
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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CC  
CC EMBL; M17599; AAA52534.1; ALT\_INIT.  
DR EMBL; X04431; CA28027.1; -  
DR EMBL; X04432; CA28028.1; -  
DR EMBL; X04433; CA28029.1; -  
DR EMBL; M27968; AAA52448.1; -  
DR EMBL; J04513; AAA52533.1; ALT\_INIT.

DR PIR; A25824; A25824.  
DR PIR; A26642; A26642.  
DR PIR; B24243; B24243.  
DR PIR; B24301; B24301.  
DR PIR; B32878; B32878.  
DR PIR; S00297; S00297.  
DR PDB; 2FGF; 15-APR-92.  
DR PDB; 4FGF; 15-JUL-93.  
DR PDB; 1FGA; 15-JUL-93.  
DR PDB; 1BFB; 03-APR-96.  
DR PDB; 1BFC; 03-APR-96.  
DR PDB; 1BFF; 16-JUN-97.  
DR PDB; 1BFG; 31-JAN-94.  
DR PDB; 2BFH; 30-APR-94.  
DR PDB; 1BLA; 08-NOV-96.  
DR PDB; 1BLD; 08-NOV-96.  
DR MIM; 134920; -  
DR PFAM; PF00167; FGF; 1.  
DR PRINTS; PRO0262; IL1HBGF.  
DR PRINTS; PRO0263; HBGF.FGF.  
DR PROSITE; PS00247; HBGF.FGF; 1.  
KW Growth factor; Mitogen; Vascularization; Heparin-binding;  
KW 3D-structure.  
FT CHAIN 1 9  
FT SITE 10 155 HEPARIN-BINDING GROWTH FACTOR 2.  
FT SITE 46 48 CELL ATTACHMENT SITE (POTENTIAL).  
FT SITE 88 90 CELL ATTACHMENT SITE (POTENTIAL).  
FT BINDING 27 31 HEPARIN (POTENTIAL).  
FT BINDING 116 119 HEPARIN (POTENTIAL).  
FT STRAND 30 34  
FT TURN 35 38  
FT STRAND 39 43  
FT TURN 45 46  
FT STRAND 49 52  
FT TURN 55 56  
FT HELIX 58 60  
FT STRAND 62 66  
FT TURN 69 70  
FT STRAND 71 76  
FT TURN 77 80  
FT STRAND 81 85  
FT TURN 87 88  
FT STRAND 91 94  
FT HELIX 99 101  
FT STRAND 103 107  
FT TURN 109 110  
FT STRAND 113 117  
FT TURN 121 122  
FT STRAND 124 124  
FT STRAND 127 127  
FT TURN 129 130  
FT STRAND 132 133  
FT HELIX 136 138  
FT TURN 141 142  
FT HELIX 144 146  
FT STRAND 148 152  
SQ SEQUENCE 155 AA; 17254 MW; BE6CE13373007129 CRC64;  
Query Match 35.7%; Score 462; DB 1; Length 155;  
Best Local Similarity 48.7%; Pred. No. 5.10e-86;  
Matches 75; Conservative 30; Mismatches 42; Indels 7; Gaps 2;  
Db 9 LPALPEDGGSAGFPFGHKDKPKRYCKNGGFFLRHDPGRVDGVREKSDPHIKLOLQAE 68  
Qy 26 YPSAPAGANGTLLDANYKKPKLLYCSNGHFLRLPDGTYDGTDRSDQHIQLQSAES 85  
Db 69 RGVSIVKGVCAENRYLANKEDGRLLASKCVTDCEFFERLESN----NNTYRSKVT-- 121  
Qy 86 VGEVIKSTETGQYLLAMDTDLGLYGSQTPNEECFLERLEENATPAPHINTYISKHAEK 145  
Db 122 SWYVALKRTGYKLGSKTGPQKAILFLPMSAKS 155  
Qy 146 NWFVGLKNGSKRGPRTHYGYKAILFLPLPVSS 179

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DR PRINTS; PR00263; HBGFFGF.
DR PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT CHAIN 9
FT PROPEP 10 154 HEPARIN-BINDING GROWTH FACTOR 2.
FT CHAIN 10 154 HEPARIN-BINDING GROWTH FACTOR 2.
FT BINDING 26 30 HEPARIN (POTENTIAL)..
FT BINDING 115 118 HEPARIN (POTENTIAL)..
SQ SEQUENCE 154 AA; 17139 MW; 1A0F14FF423D8403 CRC64;

Query Match          35.4%; Score 458; DB 1; Length 154;
Best Local Similarity 50.7%; Pred. No. 5.33e-85;
Matches 74; Conservative 26; Mismatches 39; Indels 7; Gaps 2;

Db      16 GGGAPPCHFKDKRLXCKNGGFFLRHPDGVRDVGVREKSDPHVKLQLQAEERGVWSIK 75
       : :::: | | | | | | | | | | | | | | | | | | | | | | | | | | | |
Qy     34 ANGLLDANYKKPKLLYCSNGHGFLRILPDGTVDGTRDSDOHILQLLSAESVGEVIKS 93
       : :::: | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Db      76 VCARYLAMKEDGRLASKVCITSECFPERLESN-----NYNTVRSKYIS--SWYVALKR 128
       : :::: | | | | | | | | | | | | | | | | | | | | | | | | | | | |
Qy     94 TETQGYLAMTDGILLYGSQTPNSECLERLEENATPAPHYNTYISKHAEKKNWFVLGKK 153
       : :::: | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Db      129 TGQVKLGSKTGPQGAKAILFLPMSSAKS 154
       | | | | | | | | | | | | | | | | | | | | | | | | | | | |
Qy     154 NGSCRGRPTHYGOKAILFLPLPVSS 179
       | | | | | | | | | | | | | | | | | | | | | | | | | | | |

RESULT 12
ID FGF2_MOUSE STANDARD; PRT; 154 AA.
AC PI5655;
DT 01-APR-1990 (Rel. 14, Created)
DI 01-APR-1990 (Rel. 14, Last sequence update)
DT 01-FEB-1996 (Rel. 33, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGE) (PROSTATOPIN).
GN FGF2 OR FGF-2.
OS Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
[1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 90201563.
RA Hebert J.M., Basilio C., Goldfarb M., Haub O., Martin G.R.;
RT "Isolation of cDNAs encoding four mouse FGF family members and
RT characterization of their expression patterns during embryogenesis.";
RL Dev. Biol. 138:454-463(1990).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC ARGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
CC -----
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CC use by non-profit institutions as long as its content is in no way
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CC entities requires a license agreement (see http://www.isb-sib.ch/announce/
CC or send an email to license@isb-sib.ch).
CC -----
EMBL; M30644; AAA37621.1; -.
DR PIR; C37360; C37360.
DR HSP; P09038; IBFF.
DR MGD; MG1:95516; FGF2.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00262; IL1HBGF.
DR PRINTS; PR00263; HBGFFGF.
DR PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT CHAIN 10 154 HEPARIN-BINDING GROWTH FACTOR 2.
FT PROPEP 9
```

```
DR PRINTS; PR00263; HBGFFGF.
DR PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT CHAIN 1 9
FT CHAIN 10 154 HEPARIN-BINDING GROWTH FACTOR 2.
FT BINDING 26 30 HEPARIN (POTENTIAL)..
FT BINDING 115 118 HEPARIN (POTENTIAL)..
SQ SEQUENCE 154 AA; 17139 MW; 1A0F14FF423D8403 CRC64;

Query Match          35.4%; Score 458; DB 1; Length 154;
Best Local Similarity 50.7%; Pred. No. 5.33e-85;
Matches 74; Conservative 26; Mismatches 39; Indels 7; Gaps 2;

Db      16 GGGAPPCHFKDKRLXCKNGGFFLRHPDGVRDVGREKSDPHVKLQLQAEERGVWSIK 75
       : :::: | | | | | | | | | | | | | | | | | | | | | | | | | | | |
Qy      34 ANGLLDANYKKPKLLYCSNGHGFLRILPDGTVDGTRDSDOHQLQLSAESVGEVIKS 93
       : :::: | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Db      76 VCARYLAMKEDGRLASKVCITSECFPERLESN-----NYNTVRSKYIS--SWYVALKR 128
       : :::: | | | | | | | | | | | | | | | | | | | | | | | | | | | |
Qy      94 TETQGYLAMTDGILLYGSQTPNECFLERLEENATPAPHYNTYISKHAEKKNWFVLGKK 153
       : :::: | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Db      129 TGQVKLGSKTGPQOKAILFLPMSSAKS 154
       | | | | | | | | | | | | | | | | | | | | | | | | | | | |
Qy      154 NGSCRGRPTHYGOKAILFLPLPVSS 179
       | | | | | | | | | | | | | | | | | | | | | | | | | | | |

RESULT 12
ID FGF2_MOUSE STANDARD; PRT; 154 AA.
AC PI5655;
DT 01-APR-1990 (Rel. 14, Created)
DI 01-APR-1990 (Rel. 14, Last sequence update)
DT 01-FEB-1996 (Rel. 33, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST
DE GROWTH FACTOR) (BFGE) (PROSTATOPIN).
GN FGF2 OR FGF-2.
OS Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
[1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 90201563.
RA Hebert J.M., Basillco C., Goldfarb M., Haub O., Martin G.R.;
RT "Isolation of cDNAs encoding four mouse FGF family members and
RT characterization of their expression patterns during embryogenesis.";
RL Dev. Biol. 138:454-463(1990).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC ARGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
CC -----
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CC or send an email to license@isb-sib.ch).
CC -----
EMBL; M30644; AAA37621.1; -.
DR PIR; C37360; C37360.
DR HSP; P09038; IBFF.
DR MGD; MG1:95516; FGF2.
DR PFAM; PF00167; FGF; 1.
DR PRINTS; PR00262; IL1HBGF.
DR PRINTS; PR00263; HBGFFGF.
DR PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT CHAIN 1 9
FT CHAIN 10 154 HEPARIN-BINDING GROWTH FACTOR 2.
```



FT BINDING 26 30 HEPARIN (POTENTIAL).  
 SQ SEQUENCE 115 118 HEPARIN (POTENTIAL).  
 Query Match 154 AA; 17153 MW; 689F677416274388 CRC64;  
 Best Local Similarity 35.08; Score 453; DB 1; Length 154;  
 Matches 73; Conservative 23; Mismatches 36; Indels 2;  
 Gaps 2;

Db 23 GHFKPKRYCKNGGFFLRHPDGRVREKSDPHVKLQLOAEQVWSIKGVCANRYL 82  
 QY 41 ANYKKPKLLYCSNGHFLRLPDGTGDRSDOHIQLOLSAESVGEYIKSTETGOYL 100  
 Db 83 AMKEDGRLLASKVTECEFFERLESN-----NYNYSRKYS--SWYVALKRTGYKLG 135  
 QY 101 AMDTGGLYGSQTPNEBCLFLERLEENATPAPHYNTYISKHAEKNWFVGLKNGSKRG 160  
 Db 136 SKTGPCKOKAILFLPMSAKS 154  
 QY 161 PRTHYGOKAILFLPVS 179

RESULT 13  
 ID FGF2\_MONDO STANDARD; PRT; 156 AA.  
 AC F48798;  
 DT 01-FEB-1996 (Rel. 33, Created)  
 DT 01-FEB-1996 (Rel. 33, Last sequence update)  
 DT 01-NOV-1997 (Rel. 35, Last annotation update)  
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF) (PROSTATROPIN).  
 GN Monodelphis domestica (Short-tailed grey opossum).  
 OS Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
 OC Mammalia; Metatheria; Didelphimorphia; Didelphidae; Monodelphis.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RC TISSUE=EYE;  
 RX MEDLINE; 94296558.  
 RA Kusewitt D.F., Sabourin C.L.K., Sherburn T.E., Ley R.D.;  
 RT "Characterization of cDNA encoding basic fibroblast growth factor of the marsupial Monodelphis domestica";  
 RL DNA Cell Biol. 13:549-554(1994).  
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.  
 CC -!- SUBUNIT: MONOMER.  
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES AFGE.  
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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 CC -----  
 DR EMBL; Z15154; CAA70854.1; ALT\_INIT.  
 DR HSP; P09038; 1BFF.  
 DR PFAM; PF00167; FGF; 1.  
 DR PRINTS; PR00262; IL1HBGF.  
 DR PRINTS; PR00263; HBGFEGF.  
 DR PROSITE; PS00247; HBGF\_FGF; 1.  
 KW GROWTH factor; Mitogen; Vascularization; Heparin-binding.  
 FT PROPEP 1 9 BY SIMILARITY.  
 FT CHAIN 10 156 HEPARIN-BINDING GROWTH FACTOR 2.  
 FT BINDING 28 32 HEPARIN (POTENTIAL).  
 FT BINDING 117 120 HEPARIN (POTENTIAL).  
 SQ SEQUENCE 156 AA; 17303 MW; 7E555FCC49BF1209 CRC64;  
 Query Match 34.88; Score 450; DB 1; Length 156;  
 Best Local Similarity 47.88; Pred. No. 5.78e-83;

Matches 77; Conservative 28; Mismatches 48; Indels 8; Gaps 3;  
 Db 4 GSITLPAISDGG--GGGAFFPGHEKDPKRLYCKNGGFFLRHPDGRVDRGIREKSDPNIK 62  
 QY 19 GVLGVMPSPAGARANGTLLDANYKKPKLLYCSNGGFLRLPDGTGDRSDOHIQ 78  
 Db 63 LQLOAEQVWSIKGVCANRYLAMEKEDGRLLALKYVTECEFFERLESN-----NYNYSR 117  
 QY 79 LQLSAESVGEYIKSTETGOYLAMDTGGLYGSQTPNEBCLFLERLEENATPAPHYNTI 138  
 Db 118 SRKYS--SWYVALKRTGYKLGSKTGPCKOKAILFLPMSAKS 156  
 QY 139 SKHAEKNWFVGLKNGSKRGPRTHYGOKAILFLPVS 179

RESULT 14  
 ID FGF2\_XENLA STANDARD; PRT; 155 AA.  
 AC P12226;  
 DT 01-OCT-1989 (Rel. 12, Created)  
 DT 01-JAN-1990 (Rel. 13, Last sequence update)  
 DT 01-NOV-1997 (Rel. 35, Last annotation update)  
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF).  
 GN FGF2 OR FGF-2.  
 OS Xenopus laevis (African clawed frog).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
 OC Amphibia; Batrachia; Anura; Mesobatrachia; Pipidae;  
 OC Xenopodinae; Xenopus.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 89058621.  
 RA Kimelman D., Abraham J., Haaparanta T., Palisi T., Kirschner M.;  
 RT "The presence of fibroblast growth factor in the frog egg: its role as a natural mesoderm inducer";  
 RL Science 242:1053-1056(1988).  
 RN [2]  
 RP SEQUENCE OF 95-155 FROM N.A.  
 RX MEDLINE; 88052890.  
 RA Kimelman D., Kirschner M.;  
 RT "Synergistic induction of mesoderm by FGF and TGF-beta and the identification of an mRNA coding for FGF in the early xenopus embryo";  
 RL Cell 51:869-877(1987).  
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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 CC -----  
 DR EMBL; M18067; AAA49726.1; -.  
 DR PIR; A29618; A29618.  
 DR PIR; A40117; A40117.  
 DR HSP; P09038; 1BFF.  
 DR PFAM; PF00167; FGF; 1.  
 DR PRINTS; PR00262; IL1HBGF.  
 DR PRINTS; PR00263; HBGFEGF.  
 DR PROSITE; PS00247; HBGF\_FGF; 1.  
 KW GROWTH factor; Mitogen; Vascularization; Heparin-binding.  
 FT PROPEP 1 9  
 FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.  
 FT BINDING 27 31 HEPARIN (POTENTIAL).  
 FT BINDING 116 119 HEPARIN (POTENTIAL).  
 FT CONFLICT 111 111 MISSING (IN REF.?).  
 SQ SEQUENCE 155 AA; 17241 MW; 036735C8063142FD CRC64;  
 Query Match 33.88; Score 438; DB 1; Length 155;  
 Best Local Similarity 47.48; Pred. No. 6.42e-80;  
 Matches 73; Conservative 29; Mismatches 45; Indels 7; Gaps 2;



(TM)

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Title: >US-09-121-017B-29
Description: (1F180) from US09121017B.peg
Perfect Score: 1294
Sequence: 1 MSRCGAGRVQGTLOALVFLGV .....

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1:sp\_archaea 2:sp\_bacteria 3:sp\_fungi 4:sp\_human  
5:sp\_invertebrate 6:sp\_mammal 7:sp\_mhc 8:sp\_organelle  
9:sp\_phage 10:sp\_plant 11:sp\_rodent 12:sp\_unclassified  
13:sp\_vertebrate 14:sp\_virus

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

Sult No.	Score	Query		Length	DB	ID	Description	Pred. No.
		Match	%					
1	462	35.7		196	4	P78443	21 KD BASIC FIBROBLAST	2.02e-82
2	456	35.2		130	6	P77767	BASIC FIBROBLAST GROWT	5.88e-81
3	327	25.3		101	13	P79706	BASIC FGF (FRAGMENT)	4.69e-50
4	291	22.5		146	13	Q70659	FIBROBLAST GROWTH FACT	1.08e-41
5	270	20.9		212	13	Q42407	FIBROBLAST GROWTH FACT	6.87e-37
6	266	20.6		59	4	Q16089	ACIDIC FIBROBLAST GROW	5.55e-36
7	267	20.6		60	4	Q16588	ACIDIC FIBROBLAST GROW	3.29e-36
8	264	20.4		70	11	Q34837	FIBROBLAST GROWTH FACT	1.58e-35
9	258	19.9		115	11	Q80948	BASIC FIBROBLAST GROWT	3.57e-34
10	253	19.6		252	11	O89096	FHF-4B.	4.75e-33
11	247	19.1		194	6	P79150	KERATINOCYTE GROWTH FA	1.05e-31
12	238	18.4		243	13	Q9W6A1	FIBROBLAST GROWTH FACT	1.06e-29
13	234	18.1		192	4	Q9S830	FIBROBLAST GROWTH FACT	8.13e-29
14	234	18.1		245	13	Q9W6A2	FIBROBLAST GROWTH FACT	8.13e-29
15	233	18.0		127	4	Q9Y517	FIBROBLAST GROWTH FACT	1.35e-28
16	212	16.4		196	13	Q9YH31	PUTATIVE FIBROBLAST GR	5.27e-24
17	212	16.4		206	13	Q9YG98	FIBROBLAST GROWTH FACT	5.27e-24
18	190	14.7		129	4	O60371	R33683.2.	2.60e-19
19	189	14.6		114	4	Q16443	BASIC FIBROBLAST GROWT	4.22e-19
20	189	14.6		114	4	O00537	BASIC FIBROBLAST GROWT	4.22e-19

RESULT	3	PRELIMINARY;	PRT;	101 AA.
ID	P79706			
AC	P79706;			
DT	01-MAY-1997	(TRENBLrel. 03, Created)		
DT	01-MAY-1997	(TRENBLrel. 03, Last sequence update)		
DT	01-NOV-1999	(TRENBLrel. 12, Last annotation update)		
DE	BASIC FGF (FRAGMENT)			
OS	Cynops pyrrhogaster (Japanese common newt).			
OC	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Amphibia;			
OC	Batrachia; Caudata; Salamandroidae; Salamandridae; Cynops.			
IN	[1]			
RN	SEQUENCE FROM N.A.			
RP	SEQUENCE-EMBRYO;			
RC	RA SUZUKI A.S., TABATA T., SAKAGUCHI K., TAKABATAKE T., TAKESHIMA K.			
RA	KANEDA T.;			
FT	"Serial expression of the genes in a mesodermizing ectoderms of			
NT	early Cynops gastrula";			
RL	Submitted (NOV-1996) to the EMBL/GenBank/DBJ databases.			
DR	EMBL; D89443; BAA13958.1; -			
DR	HSSP; P09038; 2BFP.			
DR	PROSITE; PS00247 HBGF_FGF; 1.			

RESULT	5		PRT;	212 AA.
ID	O42407			
AC	O42407;	PRELIMINARY;		
DT	01-JAN-1998	(TIREMBLrel. 05, Created)		
DT	01-JUN-1998	(TIREMBLrel. 06, Last sequence update)		
DT	01-NOV-1999	(TIREMBLrel. 12, Last annotation update)		
DE	FIBROBLAST GROWTH FACTOR 10.			
OS	Gallus gallus (Chicken).			
OC	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosau-			

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OS Homo sapiens (Human).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Primates; Catarrhini; Hominidae; Homo.
[1]
RN RP SEQUENCE FROM N.A.
RX MEDLINE; 94069734.
RA ZHAO X.M., YECH T.K., HIEBERT M., FRIST W.H., MILLER G.G.;
RT "The expression of acidic fibroblast growth factor (heparin-binding
RT growth factor-1) and cytokine genes in human cardiac allografts and T
RT cells."
RL Transplantation 56:1177-1182(1993).
RN [2]
RP SEQUENCE FROM N.A.
RX MEDLINE; 92202357.
RA LI Y.L., KHA H., GOLDEN J.A., MIGCHIELSEN A.A.J., GOETZL E.J.,
RA TURCK E.J.;
RT "An acidic fibroblast growth factor protein generated by alternate
RT splicing acts like an antagonist."
RL J. Exp. Med. 175:1073-1080(1992).
DR EMBL; S67292; AAB29058.1;
DR EMBL; X65779; CAA46662.1;
DR HSSP; P05230; 2AXM.
DR PFAM; PF00167; FGF; 1.
FT NON_TER 60
SQ SEQUENCE 60 AA; 6697 MW; 6CC07DFF CRC32;

Query Match 20.4%; Score 267; DB 4; Length 60;
Best Local Similarity 87.8%; Pred. No. 3.29e-36;
Matches 36; Conservative 2; Mismatches 3; Indels 0; Gaps

Db 18 LPENYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHTD 58
| :|||||
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQHIQ 78

RESULT 8
ID O54837 PRELIMINARY; PRT; 70 AA.
AC O54837;
DT 01-JUN-1998 (TrEMBLrel. 06, Created)
DT 01-JUN-1998 (TrEMBLrel. 06, Last sequence update)
DT 01-NOV-1999 (TrEMBLrel. 12, Last annotation update)
DE FIBROBLAST GROWTH FACTOR-1 (FRAGMENT).
OS Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;
OC Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
[1]
RN RP SEQUENCE FROM N.A.
RC STRAIN=C3H/HEN; TISSUE=LIVER;
RA ZHANG Y.-X., HACKSHAW K.V.;
RL Submitted (JUL-1997) to the EMBL/GenBank/DBJ databases.
DR EMBL; AF012926; AAB94020.1;
DR HSSP; P05230; 2AXM.
DR PFAM; PF00167; FGF; 1.
FT NON_TER 70
SQ SEQUENCE 70 AA; 7677 MW; 15A1BE5E CRC32;

Query Match 20.4%; Score 264; DB 11; Length 70;
Best Local Similarity 97.2%; Pred. No. 1.58e-35;
Matches 35; Conservative 1; Mismatches 0; Indels 0; Gaps

Db 35 GNKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQH 70
| :|||||
QY 41 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDRSDQH 76

RESULT 9
ID Q60487 PRELIMINARY; PRT; 115 AA.
AC Q60487;
DT 01-NOV-1996 (TrEMBLrel. 01, Created)
DT 01-NOV-1996 (TrEMBLrel. 01, Last sequence update)
DT 01-NOV-1999 (TrEMBLrel. 12, Last annotation update)
DE BASIC FIBROBLAST GROWTH FACTOR (FRAGMENT).
OS Cavia porcellus (Guinea pig).

```



**Query Match** . 18.1%; Score 234; DB 13; Length 245;  
Best Local Similarity 32.3%; Pred. No. 8.13e-29;  
**Matches** 42; Conservative 31; Mismatches 53; Indels 4; Gaps 4;

D<sub>b</sub> 194 PSSHFVPKPI 203  
Q<sub>y</sub> 168 KAILFLPLPV 177

**RESULT** 13 PRELIMINARY; PRT: 192 AA.  
ID Q95830 AC Q9W6A2  
DT 01-MAY-1999 (TrEMBLrel. 10, Created)  
DT 01-MAY-1999 (TrEMBLrel. 10, Last sequence update)  
DT 01-NOV-1999 (TrEMBLrel. 12, Last annotation update)  
DE FIBROBLAST GROWTH FACTOR 13 ISOFORM 1B.  
GN FGFI3.

G<sub>s</sub> Homo sapiens (Human).  
O<sub>c</sub> Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
O<sub>c</sub> Eutheria; Primates; Catarrhini; Hominidae; Homo.  
RN [1]  
RP SEQUENCE FROM N.A.  
TX TISSUE=BRAIN:  
KY MEDLINE; 9168751.  
RA GECEZ J., BAKER E.H., SUTHERLAND G.R., MULLEY J.C.;  
RA SPINNER N.B., ZACKAI E.H., SUTHERLAND G.R., MULLEY J.C.;  
RT "Fibroblast growth factor homologous factor 2 (FGF2); gene structure,  
RT expression and mapping to the Borjeson-Forsman-Lehmann syndrome  
RT region in Xq26 delineated by a duplication breakpoint in a BFLS-like  
RT patient.";  
RL Hum. Genet. 104:56-63(1999).  
DR EMBL; AF100144; AAD16401.1; -.  
DR HSSP; P03968; IAFc.  
DR PROSITE; PS00247; HGFG\_FGF\_1.  
SQ SEQUENCE 132 AA; 21580 MW; 9AD05A36 CRC32;

**Query Match** 18.1%; Score 234; DB 4; Length 192;  
Best Local Similarity 33.1%; Pred. No. 8.13e-29;  
**Matches** 43; Conservative 30; Mismatches 53; Indels 4; Gaps 4;

D<sub>b</sub> 20 LYSRQGYH-LQLAQDGTIDGTDKEEDSYTLFNLPVLGRVAIQGVOTKLILANNSEGYL 78  
Q<sub>y</sub> 49 LYCSNGGHFLRLPDGTVGDTRDSDOHQIQLLSAESVEGEVIYIKSTETGOYLANMDTDLGL 108

D<sub>b</sub> 79 YTSELTPECKFKESVFENY-VT-YSSMIYRQQSGRGWYLGINKEGEIMGHNKKNK 136  
Q<sub>y</sub> 109 YGSQTPTNEECLEERLENATPHNTYISKKH-AEKWNFVGLKNKGSKRGPRTHYGQ 167

D<sub>b</sub> 137 PAAHFLPKPL 146  
Q<sub>y</sub> 168 KAILFLPLPV 177

**RESULT** 14 PRELIMINARY; PRT: 245 AA.  
ID Q9W6A2 AC Q9W6A2  
DT 01-NOV-1999 (TrEMBLrel. 12, Created)  
DT 01-NOV-1999 (TrEMBLrel. 12, Last sequence update)  
DT 01-NOV-1999 (TrEMBLrel. 12, Last annotation update)  
DE FIBROBLAST GROWTH FACTOR 13 ISOFORM 1S.  
GN FGFI3.

O<sub>c</sub> Gallus gallus (Chicken).  
O<sub>c</sub> Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;  
O<sub>c</sub> Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.  
RN [1]  
RP SEQUENCE FROM N.A.  
RX MEDLINE; 99065510.  
RA MUNOZ-SANJUAN I., SIMANDL B.K., FALLON J.F., NATHANS J.;  
RT "Expression of chicken fibroblast growth factor homologous factor  
RT (FHf)-1 and of differentially spliced isoforms of FHf-2 during  
RT development and involvement of FHf-2 in chicken limb development.";  
RL Development 126:409-421(1999).  
DR EMBL; AF108755; AAD21576.1; -.  
DR PROSITE; PS00247; HGFG\_FGF\_1.  
SQ SEQUENCE 245 AA; 27605 MW; ABC17203 CRC32;

**Search completed:** Tue Aug 29 16:16:54 2000  
**Job time :** 116 secs.

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2





\*\*\*\*\*  
M P S R L H  
\*\*\*\*\*  
(TM)

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MPsrch\_pp protein - protein database search, using Smith-Waterman algorithm  
on: Tue Aug 29 15:44:29 2000; MasPar time 7.13 Seconds  
Tabular output not generated. 581.738 Million cell updates/sec

Title: >US-09-121-017B-3  
Description: (1-175)-from-US09121017B.pep  
Perfect Score: 1265  
Sequence: 1 MSRGAGRVQGTQLQALVFLGV.....PRTHYGOKAILFLPLPVSSD 175

Scoring table: PAM 150  
Gap 11

Searched: 188963 seqs, 23686106 residues

Post-processing: Minimum Match 0%  
Listing first 45 summaries

Database: a:geneseq36  
1:geneseqp

Statistics: Mean 31.422; Variance 128.911; scale 0.244

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description	Pred. No.
1	986	77.9	140	1	R25914 Human acidic fibroblas	2.28e-87
2	986	77.9	140	1	R34497 Human acidic fibroblas	2.28e-87
3	986	77.9	140	1	P90068 Human acid fibroblast	2.28e-87
4	986	77.9	140	1	R74647 Human recombinant aFGF	2.28e-87
5	986	77.9	140	1	W04806 Human acidic fibroblas	2.28e-87
6	986	77.9	140	1	P70995 Sequence of human prot	2.28e-87
7	986	77.9	141	1	R10577 Human acid fibroblas	2.28e-87
8	986	77.9	151	1	R05789 Human aFGF encoded by	2.28e-87
9	986	77.9	151	1	W92283 Human beta-endothelial	2.28e-87
10	986	77.9	154	1	W04805 Human beta-endothelial	2.28e-87
11	986	77.9	154	1	W06816 Human endothelial cell	2.28e-87
12	986	77.9	154	1	W75414 Human beta-endothelial	2.28e-87
13	986	77.9	155	1	P94037 Human acidic fibroblas	2.28e-87
14	986	77.9	155	1	R70812 FGF-1.	2.28e-87
15	986	77.9	155	1	P70482 Sequence encoded by co	2.28e-87
16	986	77.9	155	1	R80776 Fibroblast growth fact	2.28e-87
17	986	77.9	155	1	W53022 Fibroblast growth fact	2.28e-87
18	986	77.9	155	1	W75111 Fibroblast growth fact	2.28e-87
19	986	77.9	155	1	W75415 Human endothelial cell	2.28e-87
20	986	77.9	155	1	W92291 Human endothelial cell	2.28e-87
21	986	77.9	165	1	R05785 Human BEGF encoded by	2.28e-87
22	986	77.9	168	1	W06818 Human endothelial cell	2.28e-87
23	983	77.7	134	1	W75413 Human alpha-endothelia	4.64e-87

24	983	77.7	134	1	W92282 Human alpha-endothelia	4.64e-87
25	983	77.7	134	1	W04807 Human alpha-endothelia	4.64e-87
26	975	77.1	156	1	W71383 Fibroblast growth fact	3.09e-86
27	972	76.8	135	1	W06817 Human endothelial cell	6.30e-86
28	960	75.9	132	1	R11327 9 N-terminal residue d	1.08e-84
29	960	75.9	132	1	R25418 aFGF mutein #2.	1.08e-84
30	955	75.5	155	1	R25570 Recombinant human Ala1	3.53e-84
31	955	75.5	155	1	W00561 Human (Gly93) aFGF ana	3.53e-84
32	950	75.1	140	1	R65935 Fibroblast growth fact	1.15e-83
33	938	74.2	129	1	R25419 aFGF mutein #3.	1.98e-82
34	938	74.2	129	1	R11328 12 N-terminal residue	1.98e-82
35	923	73.0	154	1	R05315 Human acidic fibroblas	6.87e-81
36	917	72.5	140	1	P90069 Bovine acidic fibrobla	2.84e-80
37	917	72.5	140	1	R74648 Bovine recombinant aFG	2.84e-80
38	917	72.5	140	1	R13030 Brain-derived acidic f	2.84e-80
39	917	72.5	140	1	R65934 Bovine fibroblast grow	2.84e-80
40	917	72.5	140	1	R34496 Bovine acid fibroblas	2.84e-80
41	917	72.5	140	1	R25915 Human acidic fibroblas	2.84e-80
42	917	72.5	154	1	P90074 Recombinant human muta	2.84e-80
43	906	71.6	141	1	R25569 Recombinant bovine Ala	3.83e-79
44	906	71.6	141	1	W00560 Bovine (Ala47-Gly93) a	3.83e-79
45	900	71.1	136	1	W01747 Chimeric acid/basic fi	1.58e-78

ALIGNMENTS

RESULT 1  
ID R25914 standard; peptide; 140 AA.  
AC R25914;  
DE DT 26-JAN-1993 (first entry)  
DE Human acidic fibroblast growth factor.  
KW viral infections; viruses; FGF; herpes simplex virus; HSV-1; HSV-2;  
KW herpes varicella; herpes zoster; cytomegalovirus; influenza;  
KW human respiratory syncytial virus; Semliki Forest virus; HIV;  
KW human immunodeficiency virus; Moloney Sarcoma virus.  
OS Homo sapiens.  
PN EP-497341-A.  
PD 05-AUG-1992.  
PF 30-JAN-1992; 101541.  
PR 31-JAN-1991; GB-002145.  
PR 09-JAN-1992; GB-000410.  
PA (FARM ) FARMITALIA ERBA SRL CARLO.  
PI Battistini C, Carminati P, Garofano L, Mazue G, Ungherli D;  
DI WPI; 92-260792/32.  
PT Synergistic antiviral composition contains BFGF and sulphated  
PT Polysaccharide - for treating viral infections e.g. HSV-1 and -2,  
PT Polysaccharide, HIV, influenza virus etc.  
PS Disclosure; Page 4; 20pp; English.  
CC This sequence represents acidic fibroblast growth factor (aFGF).  
CC aFGF, or its fragments may be used in a synergistic compen. with an  
CC antivirally active sulphated polysaccharide, and one or more  
CC excipients. The compen. may be used to control herpes simplex virus  
CC (HSV-1 or -2) herpes varicella/zoster; cytomegalovirus; influenza;  
CC human respiratory syncytial virus; Semliki Forest virus; HIV or  
CC Human acidic fibroblas aFGF; Moloney Sarcoma virus; Influenza;  
CC Polysaccharide virus. The combination of aFGF with sulphated  
CC polysaccharide is found to have a greater antiviral activity than  
CC expected for an additive effect. See also R25913-5.  
SQ Sequence 140 AA;

Query Match 77.9%; Score 986; DB 1; Length 140;  
Best Local Similarity 97.8%; Pred. No. 2.28e-87;  
Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;  
Db 3 LPPGNTKKPKLLYCSNGGHFLRLPDGTVDGTRDSQHIQLQLSAEVYIKSTETG 62  
QY :|||||  
QY 38 LLDANKPKLLYCSNGGHFLRLPDGTVDGTRDSQHIQLQLSAEVYIKSTETG 97  
Db 63 QYLANDTDGLLYGSGTNPNECLFLERLEENHYNTYISKHAENWFVGLKKNKSGCKRGPR 122  
QY :|||||  
QY 98 QYLANDTDGLLYGSGTNPNECLFLERLEENHYNTYISKHAENWFVGLKKNKSGCKRGPR 157  
Db 123 THYGOKAILFLPLPVSSD 140  
:|||||

QY 158 THYGOKAILFLPLPVSSD 175

# RESULT

ID R34497; standard; protein; 140 AA.  
AC R34497;  
DT 06-AUG-1993 (first entry)  
DE Human acidic fibroblast growth factor.  
KW aFGF; mutagen; glycosylation site; glycoprotein.  
OS Homo sapiens.  
PN J05076356-A.  
PD 30-MAR-1993.  
PE 30-MAY-1991; 127435.  
PF 31-MAY-1990; JP-143388.  
PI (TAKE ) TAKEDA CHEM IND LTD.  
DR WPI; 93-139564/17.  
PT FGF mutagen prep. useful for therapy of burn or thrombosis - by transformation of lymphocyte-contained animal cell by vector  
PT contg. DNA encoding FGF mutagen.  
PT Disclosure; Page 3; 23pp; Japanese.  
CC The invention covers mutants of FGF (esp. bFGF) which contain at least one glycosylation site. The mutants can be used to treat burns and thrombosis.  
SQ Sequence 140 AA;

Query Match 77.9%; Score 986; DB 1; Length 140;  
Best Local Similarity 97.8%; Pred. No. 2.28e-87;  
Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 3 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHILQLSAESVGEVIKSTETG 62

QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHILQLSAESVGEVIKSTETG 97

Db 63 QYLAMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPR 122

QY 98 QYLAMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPR 157

Db 123 THYGOKAILFLPLPVSSD 140

QY 158 THYGOKAILFLPLPVSSD 175

RESULT 3

ID P90068 standard; protein; 140 AA.

AC P90068;

DT 1-NOV-1989 (first entry)

DE Human acid fibroblast growth factor

OS Homo sapiens

PN EP-319052-A.

PD 14-JUN-1989.

PE 14-OCT-1988; 202306.

PF 22-OCT-1987; EP-244431.

PI (MERI) Merck and Co.

DR Thomas Jar KA, Linemeyer DL;

PT WPI; 89-167092/23.

PT Mutant acidic fibroblast growth factor

PT - used for promoting repair of soft tissue, musculoskeletal

PT tissue or vascular or nerve tissue and plasminogen

PT activator prodn.

PS Disclosure; page 4; 36pp; English.

CC Amino acid sequence of human acidic fibroblast growth

CC factor (aFGF). The patent claims mutant forms which have

CC increased biological activity with(out) heparin, and promote

CC cell growth.

SQ Sequence 140 AA;

Query Match 77.9%; Score 986; DB 1; Length 140;

Best Local Similarity 97.8%; Pred. No. 2.28e-87;

Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 3 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHILQLSAESVGEVIKSTETG 62

QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHILQLSAESVGEVIKSTETG 97

Db 63 QYLAMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPR 122

QY 98 QYLAMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPR 157

Db 123 THYGOKAILFLPLPVSSD 140

QY 158 THYGOKAILFLPLPVSSD 175

QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHILQLSAESVGEVIKSTETG 97

Db 63 QYLAMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPR 122

QY 98 QYLAMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPR 157

Db 123 THYGOKAILFLPLPVSSD 140

QY 158 THYGOKAILFLPLPVSSD 175

RESULT 4

ID R74647 standard; protein; 140 AA.

AC R74647;

DT 25-SEP-1995 (first entry)

DE Human recombinant aFGF.

KW Acidic fibroblast growth factor; aFGF; vulnary; angiogenesis;

OS Homo sapiens.

PN US5401832-A.

PD 28-MAR-1995.

PF 24-DEC-1984; 685923.

PR 12-SEP-1985; US-774359.

PR 30-MAY-1986; US-868473.

PR 11-JUL-1986; US-884460.

PR 04-JUN-1987; US-054991.

PR 04-MAY-1988; US-190293.

PR 08-FEB-1991; US-654397.

PR 25-SEP-1991; US-765472.

PR 25-SEP-1992; US-951365.

PA (MERI) MERCK & CO INC.

PI Glnenez-Gallego G, Kelly LJ, Linemeyer DL, Thomas KA;

DR WPI; 95-139893/18.

PT New recombinant human acidic fibroblast growth factor - used to

PT promote cell growth, to promote wound healing, for vascular

PT grafts and blood vessel repair

PT Claim 2; Column 30; 25pp; English.

CC Oligonucleotides were synthesized on the basis of the amino acid

CC sequence of bovine acidic fibroblast growth factor (aFGF) and

CC used to produce a synthetic gene (given in 088233) incorporating

CC codons preferred by E. coli or mammalian cells, unique cloning

CC sites, etc. This synthetic gene was mutagenized to obtain a gene

CC encoding a human recombinant aFGF (R74647) having activity

CC equivalent to the native protein.

SQ Sequence 140 AA;

Query Match 77.9%; Score 986; DB 1; Length 140;

Best Local Similarity 97.8%; Pred. No. 2.28e-87;

Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 3 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHILQLSAESVGEVIKSTETG 62

QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHILQLSAESVGEVIKSTETG 97

Db 63 QYLAMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPR 122

QY 98 QYLAMTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKNGSKCRGPR 157

Db 123 THYGOKAILFLPLPVSSD 140

QY 158 THYGOKAILFLPLPVSSD 175

RESULT 5

ID W04806 standard; protein; 140 AA.

AC W04806;

DT 29-DEC-1996 (first entry)

DE Human acidic fibroblast growth factor.

KW Endothelial cell growth factor; ECGF; blood vessel; regeneration;

KW heparin-Sepharose affinity chromatography; probe; oligonucleotide;

KW FGF; fibroblast growth factor; ss.

OS Homo sapiens.

PN US552528-A.  
PD 03-SEP-1996.  
PF 03-MAR-1986; 835594.  
PR 03-MAR-1986; US-835594.  
PR 18-DEC-1987; US-134499.  
PR 29-APR-1991; US-693079.  
PR 27-NOV-1991; US-799859.  
PR 03-NOV-1994; US-334884.  
PI (RHON ) RHONE POULENC RORER PHARM INC.  
PA Burgess W. Maciag T;  
DR WPI: 96-412132/41.  
DR N-PSDB; T37503.  
PT Isolated, purified, biologically active bovine beta endothelial cell  
PT growth factor - useful to regenerate or treat damaged blood vessels  
PS Disclosure: Fig 8; 28pp; English.  
CC Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having  
CC a mol.wt. of 20 kd can be purified at least 16300 fold from bovine  
CC brain using heparin-Sepharose affinity chromatography. ECGF is  
CC useful for, among other purposes, diagnostic applications and has  
CC potential in the treatment of damaged blood vessels or other  
CC endothelial cell-lined structures.  
CC Human ECGF (T37503) or fragments may be obtained using  
CC oligonucleotides (T37504 and T37508 to T37509) whose design is based  
CC on the sequence of bovine alpha- and beta-ECGF.  
SQ Sequence 140 AA;

Query Match 77.9%; Score 986; DB 1; Length 140;  
Best Local Similarity 97.8%; Pred. No. 2.28e-87;  
Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 3 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 62  
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97  
Db 63 QYLANDTDGLLYGSOTPNEECLFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 122  
QY 98 QYLANDTDGLLYGSOTPNEECLFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 157  
Db 123 THYGOKAILFLPLPVSSD 140  
QY 158 THYGOKAILFLPLPVSSD 175

RESULT 6  
ID P70995 standard; protein; 140 AA.  
AC P70995;  
PT 13-JUN-1991 (first entry)  
PT Sequence of human proteinaceous factor (PFI) with mitogenic activity.  
PT Cell growth promoter; mitogen; vascularisation; wound healing.  
FH Homo sapiens.  
FT Key Location/Qualifiers  
FT misc\_difference 140  
FT /label= Asp-OH  
PN EP-241136-A.  
PD 14-OCT-1987.  
PF 06-MAR-1987; 301969.  
PR 07-MAR-1986; US-838096.  
PI (HARD ) HARVARD COLLEGE.  
PA Lobb RR, Harper JW, Strydom DJ;  
DR WPI: 87-28595/41.  
PT Mitogenic polypeptide isolated from human brain tissue - useful  
PT for increasing vascular effect in eg wound healing, or  
PT generating endothelial cell linings for vascular prostheses, etc.  
PS Claim 3; Page 1; 31pp; English.  
CC The PF of the invention was obtd. from human brain tissue. It has a  
CC mol. wt. of 15,200-16,500 (pref. 15,616-16,056) and has a high  
CC affinity for heparin. PFI and fragments are useful for promoting the  
CC growth of mesoderm-derived cells or neuroectoderm-derived cells and  
CC generating endothelial cell linings for vascular prostheses (all  
CC claimed). The polypeptides are useful for increasing vascularisation.  
SQ Sequence 140 AA;

Query Match 77.9%; Score 986; DB 1; Length 140;

Best Local Similarity 97.8%; Pred. No. 2.28e-87;  
Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 3 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 62  
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97  
Db 63 QYLANDTDGLLYGSOTPNEECLFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 122  
QY 98 QYLANDTDGLLYGSOTPNEECLFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 157  
Db 123 THYGOKAILFLPLPVSSD 140  
QY 158 THYGOKAILFLPLPVSSD 175

RESULT 7  
ID R10527 standard; Protein; 141 AA.  
AC R10527;  
DT 15-APR-1991 (first entry)  
DE Human acidic fibroblast growth factor gene.  
KW aFGF; antibody; antigen; cancer; ss.  
OS Homo sapiens.  
FH Key Location/Qualifiers  
FT region 2..12  
FT /label= A  
FT region 56..67  
FT /label= B  
FT region 104..114  
FT /label= C  
FT region 132..141  
FT /label= D  
PN J02306996-A.  
PD 20-DEC-1990.  
PF 03-JUL-1989; 172542.  
PR 04-JUL-1988; JP-166275.  
PR 03-JUL-1989; JP-172542.  
PA (TAKE ) TAKEDA CHEMICAL IND KK.  
DR WPI: 91-040150/06.  
DR N-PSDB; Q10399.  
PT Anti-acid antibody, for cancer diagnosis, etc. - is obtd. by  
PT using complex of partial peptide(s) of acid fibroblast growth  
PT factor and protein as antigen.  
PS Disclosure: Fig 1; 19pp; Japanese.  
CC The was deduced from a gene used to produce recombinant aFGF.  
CC Peptides derived from the protein, esp. from A-D can be used to as  
CC antigens to produce anti-aFGF antibodies. The peptides must  
CC comprise 8-10 continuous AAs from A or B (claims 5 and 6 resp.),  
CC 7-10 continuous AAs from C (claim 7), or 8-9 continuous AAs from D  
CC (claim 8). The abs can be used for immunochemically measuring aFGF,  
CC and for purifying aFGF. They are useful as reagents in the diag-  
CC nosis of various cancers or diseases of the CNS. Purified aFGF  
CC has wound healing and nerve cell proliferating properties.  
SQ Sequence 141 AA;

Query Match 77.9%; Score 986; DB 1; Length 141;  
Best Local Similarity 97.8%; Pred. No. 2.28e-87;  
Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 4 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 63  
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97  
Db 64 QYLANDTDGLLYGSOTPNEECLFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 123  
QY 98 QYLANDTDGLLYGSOTPNEECLFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 157  
Db 124 THYGOKAILFLPLPVSSD 141  
QY 158 THYGOKAILFLPLPVSSD 175



QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 97  
Db 77 QYLANDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 136  
QY 98 QYLANDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 157  
Db 137 THYGOKAILFLPLPVSSD 154  
QY 158 THYGOKAILFLPLPVSSD 175

RESULT 11  
ID W06816 standard; Protein: 154 AA.  
AC W06816;  
DT 17-MAR-1997 (first entry)  
DE Human endothelial cell growth factor-beta.  
KW Endothelial cell growth factor-beta; ECGF-beta.  
OS Homo sapiens.  
US5571790-A.  
05-NOV-1996.  
03-MAR-1986; 835594.  
03-MAR-1986; US-835594.  
18-DEC-1987; US-134499.  
29-APR-1991; US-693079.  
27-NOV-1991; US-799859.  
03-NOV-1994; US-334884.  
07-JUN-1995; US-472964.  
PA (RHON ) RHONE-POULENC RORER PHARM INC.  
PI Burgess W, Drohan WN, Jaye M, Maciag T;  
DR WPI; 96-503421/50.  
DR N-PSDB; T45983.  
PT Recombinant human endothelial cell growth factors - for treating  
PT damaged blood vessels, etc.  
PS Claim 1; Column 16; 22pp; English.  
CC Human recombinant endothelial cell growth factors (ECGF) beta  
CC (W06816) and alpha (W06817) differ only at their N-terminal ends.  
CC They can be produced in transformed prokaryotic or eukaryotic host  
CC cells using DNA sequences (T45983 and T45984, respectively) derived  
CC from the complete human ECGF cDNA (T45985). Large quantities of  
CC the ECGFs are produced by culturing the host cells and recovering  
CC the proteins. ECGFs have utility in the growth and amplification  
CC of endothelial cells in culture. They can potentially be used to  
CC treat damaged blood vessels and other endothelial cell-lined  
CC structures, and also have diagnostic applns.  
SQ Sequence 154 AA;

Query Match 77.9%; Score 986; DB 1; Length 154;  
Best Local Similarity 97.8%; Pred. No. 2.28e-87;  
Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 17 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 76  
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 97

Db 77 QYLANDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 136  
QY 98 QYLANDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 157

Db 137 THYGOKAILFLPLPVSSD 154  
QY 158 THYGOKAILFLPLPVSSD 175

RESULT 13  
ID P94037 standard; protein: 155 AA.  
AC P94037;  
DT 25-JUN-1990 (first entry)  
DE Human acidic fibroblast growth factor.  
KW Acidic fibroblast growth factor.  
OS Homo sapiens.  
PN EP-298723-A.  
PD 11-JAN-1989.  
PF 06-JUL-1988; 306158.  
PR 07-JUL-1987; US-070797.  
PA (BIOT-) Biotechn Res Assoc.  
PI Fiddes JC, Abraham JA, Protter A;  
DR WPI; 89-009785/02.  
DR N-PSDB; N93088.  
PT Recombinant DNA encoding new fibroblast growth factor  
PT analogues - useful eg for accelerating wound healing and  
PT to control neovascularisation.  
PS Disclosure; p; English.  
CC See also P94038.  
SQ Sequence 155 AA;

Query Match 77.9%; Score 986; DB 1; Length 155;  
Best Local Similarity 97.8%; Pred. No. 2.28e-87;  
Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 18 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 77  
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 97

Db 78 QYLANDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 137

PF 04-NOV-1996; 743261.  
PR 04-NOV-1996; US-743261.  
PR 03-MAR-1986; US-835594.  
PR 18-DEC-1987; US-134499.  
PR 29-APR-1991; US-693079.  
PR 27-NOV-1991; US-799859.  
PR 03-NOV-1994; US-334884.  
PR 07-JUN-1995; US-472964.  
PA (RHON ) RHONE-POULENC RORER PHARM INC.  
PI Burgess W, Drohan WN, Jaye M, Maciag T;  
DR WPI; 98-594032/50.  
PT Compositions for promoting wound healing - containing endothelial  
PT cell growth factor polypeptides  
PS Claim 1; Column 16; 23pp; English.  
CC This sequence represents the amino acid sequence of the mature human  
CC beta-endothelial cell growth factor (b-ECGF). This amino acid sequence  
CC is identical to the alpha-ECGF but the beta sequence contains an extra  
CC 20 N-terminal amino acids. The sequence was isolated from a human brain  
CC stem cell cDNA library using a probe designed based on fragments of the  
CC bovine ECGF (see W75416-W75418). The ECGF protein can be used in  
CC compositions for promoting wound healing. ECGF is also used to grow  
CC cells on a prosthetic device.  
SQ Sequence 154 AA;

Query Match 77.9%; Score 986; DB 1; Length 154;  
Best Local Similarity 97.8%; Pred. No. 2.28e-87;  
Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 17 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 76  
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 97

Db 77 QYLANDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 136  
QY 98 QYLANDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 157

Db 137 THYGOKAILFLPLPVSSD 154  
QY 158 THYGOKAILFLPLPVSSD 175

RESULT 13  
ID P94037 standard; protein: 155 AA.  
AC P94037;  
DT 25-JUN-1990 (first entry)  
DE Human acidic fibroblast growth factor.  
KW Acidic fibroblast growth factor.  
OS Homo sapiens.  
PN EP-298723-A.  
PD 11-JAN-1989.  
PF 06-JUL-1988; 306158.  
PR 07-JUL-1987; US-070797.  
PA (BIOT-) Biotechn Res Assoc.  
PI Fiddes JC, Abraham JA, Protter A;  
DR WPI; 89-009785/02.  
DR N-PSDB; N93088.  
PT Recombinant DNA encoding new fibroblast growth factor  
PT analogues - useful eg for accelerating wound healing and  
PT to control neovascularisation.  
PS Disclosure; p; English.  
CC See also P94038.  
SQ Sequence 155 AA;

Query Match 77.9%; Score 986; DB 1; Length 155;  
Best Local Similarity 97.8%; Pred. No. 2.28e-87;  
Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 18 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 77  
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 97

Db 78 QYLANDTDGLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 137

QY 98 QYAMDTDGLLYGSGTNEECFLERLEENHNTYISKHAEKNWFVGLKKNKSGCKRGPR 157  
 Db 138 THYGOKAILFLPLPVSSD 155  
 QY 158 THYGOKAILFLPLPVSSD 175

## RESULT 14

ID R70812 standard; protein; 155 AA.  
 AC R70812;  
 DT 01-SEP-1995 (first entry)  
 DE FGF-1.  
 KW FGF-1; fibroblast growth factor; cytotoxic conjugate; fusion protein;  
 KW saporin; cytostatic; tumor; diabetes; rheumatoid arthritis.  
 OS Homo sapiens.  
 FH Key Location/Qualifiers  
 FT misc\_difference 31 /note= "Cys may be replaced by Ser"  
 FT misc\_difference 132 /note= "Cys may be replaced by Ser"  
 FT W09503831-A.  
 PF 09-FEB-1995.  
 PR 27-JUL-1994; U08511.  
 PR 02-AUG-1993; US-099924.  
 PR 29-OCT-1993; US-145829.  
 PA (PR12-) PRIZM PHARM INC.  
 PA (WHIT-) WHITTIER INST DIABETES & ENDOCRINOLOGY.  
 FI Baird AJ, Lappi DN, Sosnowski BA;  
 DR WPI; 95-082038/11.  
 PT New monogenic preparations of cytotoxic conjugates and DNA -  
 PT contain fibroblast growth factors and cytotoxic agents for  
 PT treating FGF conditions such as tumours, diabetes and rheumatoid  
 PT arthritis.  
 PS Disclosure; page 108-109; 128pp; English.  
 CC Novel fusion proteins comprise FGF linked to saporin. FGF-1 to -9  
 CC may be used, pref. FGF-1 (R70812), FGF-5 (R70813), FGF-7 (R70814) or  
 CC FGF-8 (R70815) muteins, in which at least 1 Cys residue is replaced  
 CC by conservative Ser substitutions. The fusion proteins are potent  
 CC cytotoxic agents to cells bearing the FGF receptor.  
 SQ Sequence 155 AA;

Query Match 77.9%; Score 986; DB 1; Length 155;  
 Best Local Similarity 97.8%; Pred. No. 2.28e-87;  
 Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 18 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHILQLLSAESVGEVIKSTETG 77  
 QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHILQLLSAESVGEVIKSTETG 97  
 78 QYAMDTDGLLYGSGTNEECFLERLEENHNTYISKHAEKNWFVGLKKNKSGCKRGPR 137  
 QY 98 QYAMDTDGLLYGSGTNEECFLERLEENHNTYISKHAEKNWFVGLKKNKSGCKRGPR 157  
 Db 138 THYGOKAILFLPLPVSSD 155  
 QY 158 THYGOKAILFLPLPVSSD 175

## RESULT 15

ID P70482 standard; Protein; 155 AA.  
 AC P70482;  
 DT 13-MAY-1991 (first entry)  
 DE Sequence encoded by complete cDNA sequence of human endothelial  
 DE cell growth factor (ECGF).  
 KW Endothelial cell regeneration; blood vessel regeneration.  
 OS Homo sapiens.  
 FH Key Location/Qualifiers  
 FT protein 2..15  
 FT /label= Beta ECGF  
 FT protein 16..21  
 FT /label= Acidic FGF  
 FT protein 22..155  
 FT /label= Alpha ECGF

PN W08705332-A.  
 PD 11-SEP-1987.  
 PF 02-MAR-1987; U00425.  
 PR 03-MAR-1986; US-835594.  
 PR 26-MAR-1987; ES-000812.  
 PA (MELO-) MELOY LAB INC.  
 PA (RORE-) RORER BIOTECHN INC.  
 PA (RORE-) RORER.  
 PA BIOTECH INC.  
 PI Jaye M, Burgess W, Maciag T, Drohan W;  
 DR WPI; 87-264128/37.  
 DR N-PSDB; N70788  
 PT Human endothelial cell growth factor - produced by recombinant  
 PT DNA techniques, useful for wound healing  
 PS Example; Fig 8; 43pp; English.  
 CC To screen the human brain stem cDNA library for clones contg. ECGF  
 CC inserts, a specific oligonucleotide was designed. This  
 CC oligonucleotide was based upon a partial AA sequence analysis of  
 CC the amino terminus of ECGF (see P70480 and P70481). Fig 3c sets  
 CC forth for comparison the AA sequence of cyanogen bromide-cleaved  
 CC bovine alpha and beta ECGF (P70834). The two clones that were  
 CC isolated, ECGF clones 1 and 29, were analysed in further detail. The  
 CC nucleotide sequence of these clones and the AA sequence deduced from  
 CC the nucleic acid sequence is shown in Fig 8 (see N70788 and P70482).  
 SQ Sequence 155 AA;

Query Match 77.9%; Score 986; DB 1; Length 155;  
 Best Local Similarity 97.8%; Pred. No. 2.28e-87;  
 Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

Db 18 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHILQLLSAESVGEVIKSTETG 77  
 QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHILQLLSAESVGEVIKSTETG 97  
 Db 78 QYAMDTDGLLYGSGTNEECFLERLEENHNTYISKHAEKNWFVGLKKNKSGCKRGPR 137  
 QY 98 QYAMDTDGLLYGSGTNEECFLERLEENHNTYISKHAEKNWFVGLKKNKSGCKRGPR 157  
 Db 138 THYGOKAILFLPLPVSSD 155  
 QY 158 THYGOKAILFLPLPVSSD 175

Search completed: Tue Aug 29 15:45:03 2000  
 Job time : 34 secs.

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[WORLD] (TM)  
\*\*\*\*\*

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MPSrch\_pp protein - protein database search, using Smith-Waterman algorithm  
on: Tue Aug 29 15:43:38 2000; MasPar time 11.55 Seconds  
714.738 Million cell updates/sec  
Regular output not generated.

Title: >US-09-121-017B-3  
Description: (1-1757) from US09121017B.pep  
Perfect Score: 1265  
Sequence: 1 MSRGAGRVQTLQALVELGV.....PRTHYGOKAILFLPLPVSSD 175

Scoring table: PAM 150  
Gap 11

Searched: 142080 seqs, 47172406 residues

Post-processing: Minimum Match 0%  
Listing first 45 summaries

Database: plr64  
1:pir1 2:pir2 3:pir3 4:pir4

Statistics: Mean 43.514; Variance 77.023; scale 0.565

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES							
Result No.	Score	Query Match	Length	DB	ID	Description	Pred. No.
1	986	77.9	155	1	A33665	acidic fibroblast gro	6.25e-196
2	969	76.6	155	1	A60721	acidic fibroblast gro	6.16e-192
3	966	76.4	155	2	D37360	acidic fibroblast gro	3.12e-191
4	966	76.4	155	2	S04147	acidic fibroblast gro	3.12e-191
5	955	75.5	152	2	JH0476	acidic fibroblast gro	1.19e-188
6	917	72.5	155	1	GKBOA	acidic fibroblast gro	9.63e-180
7	916	72.4	155	2	A60130	acidic fibroblast gro	1.65e-179
8	906	71.6	155	2	JW0055	fibroblast growth fac	3.62e-177
9	530	41.9	189	2	A48834	basic fibroblast grow	2.16e-90
10	524	41.4	157	1	GKBOB	basic fibroblast grow	4.91e-89
11	517	40.9	146	1	S00185	basic fibroblast grow	1.87e-87
12	517	40.9	210	2	A32398	basic fibroblast grow	1.87e-87
13	513	40.6	154	2	A31674	basic fibroblast grow	1.49e-86
14	508	40.2	154	2	C37360	basic fibroblast grow	2.00e-85
15	505	39.9	164	2	S31622	basic fibroblast grow	9.45e-85
16	493	39.0	155	1	A40117	basic fibroblast grow	4.73e-82
17	473	37.4	137	2	I46711	fibroblast growth fac	1.44e-77
18	350	27.7	208	2	A48137	fibroblast growth fac	1.85e-50
19	350	27.7	208	2	S66486	fibroblast growth fac	1.85e-50
20	332	26.2	207	2	JC5941	fibroblast growth fac	1.40e-46
21	327	25.8	207	2	JC5940	fibroblast growth fac	1.65e-45
22	303	24.0	194	2	S49501	keratinocyte growth f	2.14e-40
23	300	23.7	194	1	A36301	fibroblast growth fac	9.25e-40

ALIGNMENTS

RESULT 1

ENTRY A33665 #type complete  
TITLE acidic fibroblast growth factor 1 precursor - human  
ALTERNATE\_NAMES beta-ECGF; endothelial cell growth factor beta;  
heparin-binding growth factor 1

ORGANISM #fuxmal\_name Homo sapiens #common\_name man  
DATE 10-Sep-1999 #sequence\_revision 10-Sep-1999 #text\_change 10-Sep-1999

ACCESSIONS A33665; A32316; S18217; A43804; A24662; JH0707; S35535;  
S35536; I39413; A23553; A24820; A24433; A24301; A26386;  
A33639

REFERENCE A33665  
#authors Mergia, A.; Tischer, E.; Graves, D.; Tumolo, A.; Miller, J.; Gospodarowicz, D.; Abraham, J.A.; Shipley, G.D.; Fiddes, J.C.

#journal Biochem. Biophys. Res. Commun. (1989) 164:1121-1129  
#title Structural analysis of the gene for human acidic fibroblast growth factor.  
#cross-references MUID:90073637  
#accession A33665  
#molecule\_type DNA  
#residues 1-155 #label MER  
#cross-references GB:M30491

REFERENCE A32316  
#authors Wang, W.P.; Lehtoma, K.; Varban, M.L.; Krishnan, I.; Chiu, I.M.

#journal Mol. Cell. Biol. (1989) 9:2387-2395  
#title Cloning of the gene coding for human class 1 heparin-binding growth factor and its expression in fetal tissues.  
#cross-references MUID:89343957  
#accession A32316  
#molecule\_type DNA  
#residues 1-155 #label WAN  
#cross-references GB:M23087; NID:g183875; PIDN:AAA52638.1; PID:g386768  
S16217

REFERENCE S16217  
#authors Wang, W.P.; Quick, D.; Balcerzak, S.P.; Needleman, S.W.; Chiu, I.M.

#journal Oncogene (1991) 6:1521-1529  
#title Cloning and sequence analysis of the human ac dic fibroblast growth factor gene and its preservation in eukemia patients.  
#cross-references MUID:92019819  
#accession S18217  
#molecule\_type DNA  
#residues 1-155 #label WA2  
#cross-references EMBL:M23086  
A43804

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#authors      Chiu, I.M.; Wang, W.P.; Lehtoma, K.
#journal      Oncogene (1990) 5:755-762
#title        Alternative splicing generates two forms of mRNA coding for
               human heparin-binding growth factor 1.
#cross-references EMBL:X51943; NID:g32435; PIDN:CAA36206.1; PID:g32436
#accession     A43804
#molecule_type mRNA
#residues      1-155 #label CHI
#cross-references EMBL:X51943; NID:g32435; PIDN:CAA36206.1; PID:g32436
REFERENCE      A24662
#authors      Jaye, M.; Hawk, R.; Burgess, W.; Ricca, G.A.; Chiu, I.M.;
               Ravera, M.W.; O'Brien, S.J.; Modi, W.S.; Maciag, T.;
               Drohan, W.N.
#journal      Science (1986) 233:541-545
#title        Human endothelial cell growth factor: cloning, nucleotide
               sequence, and chromosome localization.
#cross-references MUID:86261805
#accession     A24662
#molecule_type mRNA
#residues      1-155 #label JAY
#cross-references GB:M33361; NID:g181941; PIDN:AAA79245.1; PID:g181942
REFERENCE      JH0707
#authors      Yu, Y.L.; Kha, H.; Golden, J.A.; Migchielsen, A.A.J.; Goetzl,
               E.J.; Turck, C.W.
#journal      J. Exp. Med. (1992) 175:1073-1080
#title        An acidic fibroblast growth factor protein generated by
               alternate splicing acts like an antagonist.
#cross-references MUID:92202857
#accession     JH0707
#molecule_type mRNA
#residues      1-155 #label YUY
#cross-references GB:X65778; NID:g396163; PIDN:CAA46661.1; PID:g396164
REFERENCE      S35535
#authors      Payson, R.A.; Canatan, H.; Chotani, M.A.; Wang, W.P.; Harris,
               S.E.; Myers, R.L.; Chiu, I.M.
#journal      Nucleic Acids Res. (1993) 21:489-495
#title        Cloning of two novel forms of human acidic fibroblast growth
               factor (aFGF) mRNA.
#cross-references MUID:93181239
#accession     S35535
#status        translation not shown
#molecule_type mRNA
#residues      1-58 #label PAY
#cross-references GB:L01485
#accession     S35536
#status        translation not shown
#molecule_type mRNA
#residues      1-58 #label PA2
#cross-references GB:L01487
REFERENCE      I39412
#authors      Crumley, G.; Dionne, C.A.; Jaye, M.
#journal      Biochem. Biophys. Res. Commun. (1990) 171:7-13
#title        The gene for human acidic fibroblast growth factor encodes
               two upstream exons alternatively spliced to the first
               coding exon.
#cross-references MUID:90365758
#accession     I39413
#status        translation not shown
#molecule_type mRNA
#residues      1-40 #label RES
#cross-references GB:M60515; NID:g178226; PIDN:AAA51672.1; PID:g553170;
               GB:M60516; NID:g178232; PID:g553171
REFERENCE      A23553
#authors      Harper, J.W.; Strydom, D.J.; Lobb, R.R.
#journal      Biochemistry (1986) 25:4097-4103
#cross-references MUID:86296647
#accession     A23553
#molecule_type protein
#residues      16-155 #label HAR
REFERENCE      A24820
#authors      Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal      Biochem. Biophys. Res. Commun. (1986) 138:611-617
#title        The complete amino acid sequence of human brain-derived
               acidic fibroblast growth factor.
#cross-references MUID:86295741
#accession     A24820
#molecule_type protein
#residues      16-155 #label GIM
REFERENCE      A90122
#authors      Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal      Biochem. Biophys. Res. Commun. (1986) 135:541-548
#title        Human brain-derived acidic and basic fibroblast growth
               factors: amino terminal sequences and specific mitogenic
               activities.
#cross-references MUID:86186784
#accession     A24243
#molecule_type protein
#residues      16-47 #label GI2
#experimental_source brain
REFERENCE      A91364
#authors      Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
#journal      FEBS Lett. (1986) 204:203-207
#title        Partial molecular characterization of endothelial cell
               mitogens from human brain: acidic and basic fibroblast
               growth factors.
#cross-references MUID:86275260
#accession     A24301
#molecule_type protein
#residues      16-30,'X',32-49 #label GAU
REFERENCE      A26386
#authors      Gautschi-Sova, P.; Muller, T.; Bohlen, P.
#journal      Biochem. Biophys. Res. Commun. (1986) 140:874-880
#title        Amino acid sequence of human acidic fibroblast growth factor.
#cross-references MUID:87048871
#accession     A26386
#molecule_type protein
#residues      16-155 #label GA2
#experimental_source brain
REFERENCE      A53639
#authors      Chavan, A.J.; Haley, B.E.; Volkin, D.B.; Marfia, K.E.;
               Verticelli, A.M.; Bruner, M.W.; Draper, J.P.; Burke, C.J.;
               Midaugh, C.R.
#journal      Biochemistry (1994) 33:7193-7202
#title        Interaction of nucleotides with acidic fibroblast growth
               factor (FGF-1).
#cross-references MUID:94271773
#accession     A53639
#molecule_type protein
#residues      16-30,'X',32-38;73-75,'X',77-97,'X',99-101;128-131,'X',
               133-140,'X',142-152 #label CHA
GENETICS
#gene          GDB:FGF1; FGFA
#cross-references GDB:119909; OMIM:131220
#map_position  5q31.3-5q33.2
#introns       57/1; 91/3
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS        alternative splicing; growth factor; heparin binding
FEATURE
16-155          #product fibroblast growth factor 1 #status experimental
129             #binding_site carbohydrate (Asn) (covalent) #status
               absent
SUMMARY         #length 155 #molecular-weight 17460 #checksum 9243
               Query Match 77.9%; Score 986; DB 1; Length 155;
               Best Local Similarity 97.8%; Pred. No. 6.25e-196;
               Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;
Db 18 LPPGNYKKPKLLYCSNGGHFLRLPDGTVDGTRDSRDSQHQIQLQLSAESVGEVIKSTEG 77
QY :|||||
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVDGTRDSRDSQHQIQLQLSAESVGEVIKSTEG 97
Db 78 QYLANDTDGLLYGSQTPNECLFLERLENNHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 137
QY 98 QYLANDTDGLLYGSQTPNECLFLERLENNHYNTYISKHAEKNWFVGLKKNKSGCKRGPR 157

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Db 138 THYGQKAILFLPLPVSSD 155
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QY 158 THYGQKAILFLPLPVSSD 175

RESULT 2
ENTRY A60721 #type complete
TITLE acidic fibroblast growth factor - golden hamster
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Mesocricetus auratus #common_name golden hamster
DATE 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 10-Sep-1999

ACCESSIONS A60721
REFERENCE Hall, J.A.; Harris, M.A.; Malark, M.; Mansson, P.E.; Zhou, H.; Harris, S.E.
#journal J. Cell. Biochem. (1990) 43:17-26
#title Characterization of the hamster DDT-1 cell aFGF/HGBF-I gene and cDNA and its modulation by steroids.
#cross-references MUID:90270291
#accession A60721
#status not compared with conceptual translation
#molecule_type DNA
#residues 1-155 #label HAL
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17403 #checksum 9573

Query Match 76.6%; Score 969; DB 1; Length 155;
Best Local Similarity 95.7%; Pred. No. 6.16e-192;
Matches 132; Conservative 2; Mismatches 4; Indels 0; Gaps 0;

Db 18 LPPGNYKPKLLYCSNGHFLRLPDGTVDRSDQHIOQLSAESAGEVYIKGTGTG 77
|:|||||
QY 38 LLDANVKKPKLLYCSNGHFLRLPDGTVDRSDQHIOQLSAESAGEVYIKGTGTG 97
|:|||||

Db 78 QYLANDTDGLLYGSQTPNEECFLERLEENHYNTYTSKKHAEKNWFVGLKKNKSGCKRGPR 137
|||||
QY 98 QYLANDTDGLLYGSQTPNEECFLERLEENHYNTYTSKKHAEKNWFVGLKKNKSGCKRGPR 157
|||||

Db 138 THYGQKAILFLPLPVSSD 155
|||||
QY 158 THYGQKAILFLPLPVSSD 175

RESULT 3
ENTRY D37360 #type complete
TITLE acidic fibroblast growth factor - mouse
ALTERNATE_NAMES aFGF; FGF-1
ORGANISM #formal_name Mus musculus #common_name house mouse
DATE 17-Apr-1993 #sequence_revision 17-Apr-1993 #text_change 16-Jul-1999

ACCESSIONS D37360; JC5231
REFERENCE Hebert, J.M.; Basilico, C.; Goldfarb, M.; Haub, O.; Martin, G.R.
#journal Dev. Biol. (1990) 138:454-463
#title Isolation of cDNAs encoding four mouse FGF family members and characterization of their expression patterns during embryogenesis.
#cross-references MUID:90201563
#accession D37360
#status preliminary
#molecule_type mRNA
#residues 1-155 #label HEB
#cross-references GB:M30641; NID:g193284; PIDN:AAA37618.1; PID:g309236
REFERENCE JC5231
#authors Madial, F.; Hackshaw, K.V.; Chiu, I.M.
#journal Gene (1996) 179:231-236
#title Cloning and characterization of the mouse Fgf-1 gene.
#cross-references MUID:97128312
#accession JC5231
#status preliminary

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#molecule_type DNA
#residues 1-155 #label MAD
#cross-references GB:U36456
COMMENT This protein is an inducer of neovascularization in angiogenic disease including atherosclerosis, cancer and inflammatory autoimmune disease.

GENETICS
#gene Fgf-1
#introns 57/1; 91/3
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341

Query Match 76.4%; Score 966; DB 2; Length 155;
Best Local Similarity 96.3%; Pred. No. 3.12e-191;
Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKPKLLYCSNGHFLRLPDGTVDRSDQHIOQLSAESAGEVYIKGTGTG 80
|:|||||
QY 41 ANYKPKLLYCSNGHFLRLPDGTVDRSDQHIOQLSAESAGEVYIKGTGTG 100
|:|||||

Db 81 AMDTEGLLYGSQTPNEECFLERLEENHYNTYTSKKHAEKNWFVGLKKNKSGCKRGPR 140
|||||
QY 101 AMDTDGLLYGSQTPNEECFLERLEENHYNTYTSKKHAEKNWFVGLKKNKSGCKRGPR 160
|||||

Db 141 GQKAILFLPLPVSSD 155
|||||
QY 161 GQKAILFLPLPVSSD 175

RESULT 4
ENTRY S04147 #type complete
TITLE acidic fibroblast growth factor 1 - rat
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Rattus norvegicus #common_name Norway rat
DATE 28-Feb-1990 #sequence_revision 28-Feb-1990 #text_change 16-Jul-1999

ACCESSIONS S04147
REFERENCE Goodrich, S.P.; Yan, G.C.; Bahrenburg, K.; Mansson, P.E.
#journal Nucleic Acids Res. (1989) 17:2867
#title The nucleotide sequence of rat heparin binding growth factor 1 (HBGF-1).
#cross-references MUID:89240051
#accession S04147
#molecule_type mRNA
#residues 1-155 #label GOO
#cross-references EMBL:X14232; NID:g56351; PIDN:CAA32448.1; PID:g56352
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341

Query Match 76.4%; Score 966; DB 2; Length 155;
Best Local Similarity 96.3%; Pred. No. 3.12e-191;
Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;

Db 21 GNYKPKLLYCSNGHFLRLPDGTVDRSDQHIOQLSAESAGEVYIKGTGTG 80
|:|||||
QY 41 ANYKPKLLYCSNGHFLRLPDGTVDRSDQHIOQLSAESAGEVYIKGTGTG 100
|:|||||

Db 81 AMDTEGLLYGSQTPNEECFLERLEENHYNTYTSKKHAEKNWFVGLKKNKSGCKRGPR 140
|||||
QY 101 AMDTDGLLYGSQTPNEECFLERLEENHYNTYTSKKHAEKNWFVGLKKNKSGCKRGPR 160
|||||

Db 141 GQKAILFLPLPVSSD 155
|||||
QY 161 GQKAILFLPLPVSSD 175

RESULT 5
ENTRY JH0476 #type fragment
TITLE acidic fibroblast growth factor - pig (fragment)
ORGANISM #formal_name Sus scrofa domestica #common_name domestic pig
DATE 31-Mar-1992 #sequence_revision 31-Mar-1992 #text_change

```

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16-Jul-1999
ACCESSIONS JH0476; S20072
REFERENCE JH0476
#authors Schmidt, M.; Sharma, H.S.; Schott, R.J.; Schaper, W.
#journal Biochem. Biophys. Res. Commun. (1991) 180:853-859
#title Amplification and sequencing of mRNA encoding acidic fibroblast growth factor (aFGF) from porcine heart.
#cross-references MUID:92062117
#accession JH0476
#molecule_type mRNA
#residues 1-152 #label SCH
##cross-references EMBL:X60317; NID:g1873; PIDN:CAA42869.1; PID:g1874
##experimental_source heart
#note the hydrophobic core residues are packed around the internal symmetry axis
COMMENT This protein belongs to the fibroblast growth factor family.
CLASSIFICATION superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
FEATURE
22-28 #region nuclear location signal\
133 #binding_site heparin (Lys) #status predicted
SUMMARY
length 152 #checksum 1124
Query Match 75.5%; Score 955; DB 2; Length 152;
Best Local Similarity 95.6%; Pred. No. 1.19e-188;
Matches 129; Conservative 2; Mismatches 4; Indels 0; Gaps 0;
Db 18 LPPGNYKPKLLKSGNGHFILPDGTVDGTRDRSQHQLQLSASVGEVIKSTETG 77
| :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 38 LLDYKPKLLKSGNGHFILPDGTVDGTRDRSQHQLQLSASVGEVIKSTETG 97
| :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
Db 78 QYLAAMD7GLLYSGTPEECFLERLEENHYNTYTKKHAENFVGLKNGSKRGPR 137
| :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
Qy 98 QYLAAMD7GLLYSGTPEECFLERLEENHYNTYTKKHAENFVGLKNGSKRGPR 157
| :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
Db 138 THYGOKAILFLPLPV 152
| :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||
Qy 158 THYGOKAILFLPLPV 172
| :|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||

RESULT 6
ENTRY GKBOA #type complete
TITLE acidic fibroblast growth factor precursor - bovine
ALTERNATE_NAMES aFGF; eye-derived growth factor II; heparin-binding growth factor I; prostatin
ORGANISM #formal_name Bos primigenius taurus #common_name cattle
DATE 13-Aug-1986 #sequence_revision 03-Feb-1994 #text_change
18-Jun-1999
CESSIONS JH0613; S02102; S02065; B24663; A94281; S03953;
A91010; A24477; B25043; C25043; A24539; A60884;
A37892; B37892; A61198; I46024; A34477; A01385
JH0613
REFERENCE Renaud, F.; Desset, S.; Bugra, K.; Halley, C.; Philippe, J.M.; Courtois, Y.; Laurent, M.
#journal Biochem. Biophys. Res. Commun. (1992) 184:945-952
#title Heterogeneity of 3' untranslated region of bovine acidic FGF transcripts.
#cross-references MUID:92246990
#accession JH0613
#molecule_type DNA
#residues 58-155 #label REN
REFERENCE S02102
#authors Halley, C.; Courtois, Y.; Laurent, M.
#journal Nucleic Acids Res. (1988) 16:10913
#title Nucleotide sequence of bovine acidic fibroblast growth factor cDNA.
#cross-references MUID:89083506
#accession S02102
#molecule_type mRNA
#residues 1-155 #label HAL
#cross-references EMBL:X13221; NID:g347; PIDN:CAA31610.1; PID:g348
REFERENCE S02661
#authors Alterio, J.; Halley, C.; Brou, C.; Soussi, T.; Courtois, Y.;

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Laurent, M.
#journal FEBS Lett. (1988) 242:41-46
#title Characterization of a bovine acidic FGF cDNA clone and its expression in brain and retina.
#cross-references MUID:89078619
#accession S02661
#molecule_type mRNA
#residues 1-155 #label ALT
##cross-references EMBL:X14032; NID:g322; PIDN:CAA32192.1; PID:g323
REFERENCE S22065
#authors Philippe, J.M.
#submission submitted to the EMBL Data Library, May 1992
#accession S22065
#molecule_type mRNA
#residues 1-18 #label PHI
##cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
REFERENCE A94290
#authors Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman, J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal Science (1986) 233:545-548
#title Nucleotide sequence of a bovine clone encoding the angiogenic protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession B24663
#molecule_type mRNA
#residues 62-102 #label ABR
REFERENCE A94281
#authors Glimenez-Gallego, G.; Rodkey, J.; Bennett, C.; Rios-Candelore, M.; DiSalvo, J.; Thomas, K.
#journal Science (1985) 230:1385-1388
#title Brain-derived acidic fibroblast growth factor: complete amino acid sequence and homologies.
#cross-references MUID:86070224
#accession A94281
#molecule_type protein
#residues 16-155 #label GIM
REFERENCE S03953
#authors Quinkler, W.; Maasberg, M.; Bernotat-Danielowski, S.; Luethe, N.; Sharma, H.S.; Schaper, W.
#journal Eur. J. Biochem. (1989) 181:67-73
#title Isolation of heparin-binding growth factors from bovine, porcine and canine hearts.
#cross-references MUID:89231704
#accession S03953
#molecule_type protein
#residues 16-45 #label QUI
REFERENCE A91010
#authors Bohlen, P.; Esch, F.; Baird, A.; Gospodarowicz, D.
#journal EMBO J. (1985) 4:1951-1956
#title Acidic fibroblast growth factor (FGF) from bovine brain: amino-terminal sequence and comparison with basic FGF.
#cross-references MUID:86055750
#accession A91010
#molecule_type protein
#residues 16-30, 'X', 32-34, 'X', 36-44 #label BOH
REFERENCE A24477
#authors Crabb, J.W.; Ames, L.G.; Carr, S.A.; Johnson, C.M.; Roberts, G.D.; Bordoli, R.S.; McKeehan, W.L.
#journal Biochemistry (1986) 25:4988-4993
#title Complete primary structure of prostatin, a prostate epithelial cell growth factor.
#cross-references MUID:87026586
#accession A24477
#molecule_type protein
#residues 2, 'GE', 5-155 #label CRA
REFERENCE A94127
#authors Burgess, W.H.; Mehman, T.; Marshak, D.R.; Fraser, B.A.; Maciag, T.
#journal Proc. Natl. Acad. Sci. U.S.A. (1986) 83:7216-7220
#title Structural evidence that endothelial cell growth factor beta is the precursor of both endothelial cell growth factor alpha and acidic fibroblast growth factor.
#cross-references MUID:87016918

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Dev. Biol. (1985) 107:110-118

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#journal Biochem. Biophys. Res. Commun. (1989) 165:1096-1103
#title A novel 17 kD heparin-binding growth factor (HBGF-8) in
        bovine uterus: purification and N-terminal amino acid
        sequence.
#cross-references MUID:90121211
#accession A33784
##molecule_type protein
##residues 1-14 ##label MIL
##note demonstration of a possible alternative initiator or
        splice junction
REFERENCE
#authors Bertolini, J.; Hearn, M.T.W.
#journal Mol. Cell. Endocrinol. (1987) 51:187-199
#title Isolation, characterisation and tissue localisation of an
        N-terminal-truncated variant of fibroblast growth factor.
#cross-references MUID:87247652
#accession A61550
##molecule_type protein
##residues 16-35 ##label BER
REFERENCE
#authors Ueno, N.; Baird, A.; Esch, F.; Ling, N.; Guillemin, R.
#journal Mol. Cell. Endocrinol. (1987) 49:189-194
#title Isolation and partial characterization of basic fibroblast
        growth factor from bovine testis.
#cross-references MUID:87162856
#accession A61551
##molecule_type protein
##residues 27-35, 'X', 37-41 ##label UE3
##experimental_source testes
##note This form appears to be identical to the renal form
REFERENCE
#authors Ueno, N.; Baird, A.; Esch, F.; Shimasaki, S.; Ling, N.;
        Guillemin, R.
#journal Regul. Pept. (1986) 16:135-145
#title Purification and partial characterization of a mitogenic
        factor from bovine liver: structural homology with basic
        fibroblast growth factor.
#cross-references MUID:87119165
#accession A60310
##molecule_type protein
##residues 23-35, 'X', 37-42 ##label UEN
##experimental_source liver
REFERENCE
#authors Ueno, N.; Baird, A.; Esch, F.; Ling, N.; Guillemin, R.
#journal Biochem. Biophys. Res. Commun. (1986) 138:580-588
#title Isolation of an amino terminal extended form of basic
        fibroblast growth factor.
#cross-references MUID:86295737
#contents annotation
#note the amino end of this form was blocked; the peptide
        composition matched what was thought to be the signal
        sequence
REFERENCE
#authors Gospodarowicz, D.; Baird, A.; Cheng, J.; Lui, G.M.; Esch, F.;
        Böhlen, P.
#journal Endocrinology (1986) 118:82-90
#title Isolation of fibroblast growth factor from bovine adrenal
        gland: physicochemical and biological characterization.
#cross-references MUID:86081530
#accession A61094
##molecule_type protein
##residues 12-25, 27-35, 'X', 37-40 ##label GOS
##experimental_source adrenal gland
REFERENCE
#authors Esch, F.; Baird, A.; Ling, N.; Ueno, N.; Hill, F.; Denoroy,
        L.; Klepper, R.; Gospodarowicz, D.; Böhlen, P.; Guillemin,
        R.
#journal Proc. Natl. Acad. Sci. U.S.A. (1985) 82:6507-6511
#title Primary structure of bovine pituitary basic fibroblast growth
        factor (FGF) and comparison with the amino-terminal
        sequence of bovine brain acidic FGF.
#cross-references MUID:86016731
#accession A01386

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##molecule_type protein
##residues 12-157 ##label ESC
##experimental_source pituitary gland
REFERENCE
#authors Baird, A.; Esch, F.; Böhlen, P.; Ling, N.; Gospodarowicz, D.
#journal Regul. Pept. (1985) 12:201-213
#title Isolation and partial characterization of an endothelial cell
        growth factor from the bovine kidney: homology with basic
        fibroblast growth factor.
#cross-references MUID:86095426
#accession A60316
##molecule_type protein
##residues 27-35, 'X', 37-43 ##label BAI
##experimental_source kidney
REFERENCE
#authors Böhlen, P.; Baird, A.; Esch, F.; Ling, N.; Gospodarowicz, D.
#journal Proc. Natl. Acad. Sci. U.S.A. (1984) 81:5364-5368
#title Isolation and partial molecular characterization of pituitary
        fibroblast growth factor.
#cross-references MUID:84298139
#accession A22054
##molecule_type protein
##residues 12-26 ##label BOH
COMMENT The acidic and basic fibroblast growth factors are the major
        endothelial-cell growth factors. Both are angiogenic agents in
        vivo and are potent mitogens for a variety of mesoderm-derived
        cell types in vitro (although bFGF is 30-100 times more potent
        than aFGF in stimulating the proliferation of normal diploid
        cells).
COMMENT This protein binds heparin more strongly than does aFGF.
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS alternative splicing; angiogenesis; growth factor; heparin
        binding; mitogen
FEATURE
1-157 #product basic fibroblast growth factor, uterine form
        #status predicted #label MAT1\
4-157 #product basic fibroblast growth factor, pituitary gamma
        form #status experimental #label MAT2\
12-157 #product basic fibroblast growth factor, pituitary alpha
        form #status experimental #label MAT3\
16-157 #product basic fibroblast growth factor, pituitary short
        form #status predicted #label MAT4\
23-157 #product basic fibroblast growth factor, hepatic form
        #status experimental #label MAT5\
27-157 #product basic fibroblast growth factor, renal form
        #status experimental #label MAT6\
29-33, 118-121 #region heparin binding #status predicted\
4 #modified site blocked amino end (Ala) (in mature form
        pituitary gamma) (probably acetylated) #status
        experimental
SUMMARY #length 157 #checksum 1115
Query Match 41.4%; Score 524; DB 1; Length 157;
Best Local Similarity 51.0%; Pred. No. 4,91e-89;
Matches 76; Conservative 29; Mismatches 42; Indels 2; Gaps 1;
Db 11 LPALPDEGSGAFPPCHPKDKPKRYCKNGGFLRHPDGRVDGVEKSDPHKQLQAE 70
QY 26 VPSAGARANTLLDANKPKPKLYCSNGHFLRLPDGTVDGTRDSRQHIQLQSAES 85
Db 71 RGWSIKGVCANRYLAKMKDGRLLASKCVTDCFFERLESNNYTYRSKY--SWYVA 128
QY 86 VGEVIKSTGQYLAAMDTDGLLYGSQTPNECLFLERLEENHYTYISKRAENWFG 145
Db 129 LKRTQYKLPKTPGQKAILFLPMSAKS 157
QY 146 LKNGSKCRGPPTHYQKAILFLPLPVSS 174
RESULT 11
ENTRY #type complete
TITLE basic fibroblast growth factor - sheep
ALTERNATE_NAMES prostatotropin

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ORGANISM      #formal_name Ovis orientalis aries, Ovis ammon aries
#common_name domestic sheep
DATE          10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change
10-Sep-1999
ACCESSIONS    S00185
REFERENCE     #authors Simpson, R.J.; Moritz, R.L.; Lloyd, C.J.; Fabri, L.J.; Nice,
              E.C.; Rubira, M.R.; Burgess, A.W.
#journal      FEBS Lett. (1987) 224:128-132
#title       Primary structure of ovine pituitary basic fibroblast growth
              factor.
#cross-references MUID:88055577
#accession    S00185
#molecule_type protein
#residues     1-146 #label SIM
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS      growth factor; heparin binding; mitogen
FEATURE
18-22         #region heparin binding #status predicted
107-110       #region heparin binding #status predicted
#length 146 #molecular_weight 16434 #checksum 3560
MMARY
Query Match 40.9%; Score 517; DB 1; Length 146;
Best Local Similarity 50.7%; Pred. NO. 1.87e-87;
Matches 75; Conservative 29; Mismatches 42; Indels 2; Gaps 1;

Db 1 PALPEDGSSAPPCHPKDRLKCKNGGFLRHPDGRVDGVRKSDPHIKLQAEER 60
   | : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY 27 PSPAGARANGTLLDANKPKRLKCSNGHFLRILPDGTVDGTRDSRQHTQLQSAESV 86
   | : : : : : : : : : : : : : : : : : : : : : : : : : : : :
Db 61 GVVSIGKVCANRYLAMKEDGRLKASKVTCDFEERLESNNYYSRKYV--SWVAL 118
   | : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY 87 GEVTKSTETQYLDMDTGLYGSQTPNECLFLERLENNHYNTYISKRAKNWFEVL 146
   | : : : : : : : : : : : : : : : : : : : : : : : : : : : :
Db 119 KRTQYKLGPKTGQKAILFLPMSSAKS 146
   | : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY 147 KKGSKRGPRTHYQKAILFLPLPVS 174

RESULT 12
ENTRY      A32398 #type complete
TITLE      basic fibroblast growth factor precursor, 22.5K form - human
ALTERNATE_NAMES bFGF: fibroblast growth factor 2; prostatic growth factor;
                prostatin
CONTAINS    basic fibroblast growth factor, 18K form
ORGANISM    #formal_name Homo sapiens #common_name man
DATE        31-Jul-1989 #sequence_revision 31-Dec-1993 #text_change
16-Jul-1999
ACCESSIONS A32398; A61537; A26642; B32878; S00297; A54316; B54316;
            A32364; A25824; B24243; B24301; S42242; B55784; I52267;
            S46253
REFERENCE   A32398
#authors    Prats, H.; Kaghad, M.; Prats, A.C.; Klagsbrun, M.; Lelias,
            J.M.; Liauzun, P.; Chalon, P.; Tauber, J.P.; Amalric, F.;
            Smith, J.A.; Caput, D.
#journal    Proc. Natl. Acad. Sci. U.S.A. (1989) 86:1836-1840
#title      High molecular mass forms of basic fibroblast growth factor
            are initiated by alternative CUG codons.
#cross-references MUID:89184522
#accession  A32398
#molecule_type mRNA
#residues   1-210 #label PRA
#cross-references GB:J04513; NID:g183083; PIDN:AAA52531.1; PID:g459811
REFERENCE   A61537
#authors    Shibata, F.; Baird, A.; Florkiewicz, R.Z.
#journal    Growth Factors (1991) 4:277-287
#title      Functional characterization of the human basic fibroblast
            growth factor gene promoter.
#cross-references MUID:92110035
#accession  A61537
#molecule_type DNA
#residues   1-114 #label SHI
#note       authors translated the codon GGA for residue 47 as Ala

```

```

REFERENCE     A26642
#authors      Kurokawa, T.; Sasada, R.; Iwane, M.; Igarashi, K.
#journal      FEBS Lett. (1987) 213:189-194
#title       Cloning and expression of cDNA encoding human basic
            fibroblast growth factor.
#cross-references MUID:87162468
#accession    A26642
#molecule_type mRNA
#residues     56-210 #label KUR
#cross-references GB:M27968; NID:g182562; PIDN:AAA52448.1; PID:g182563
REFERENCE     A30924
#authors      Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes,
            J.C.
#journal      Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668
#title       Human basic fibroblast growth factor: nucleotide sequence,
            genomic organization, and expression in mammalian cells.
#cross-references MUID:87217066
#accession    B32878
#molecule_type mRNA
#residues     56-210 #label ABR
#note        the authors translated the codon GAA for residue 108 as
            Gly
REFERENCE     S00297
#authors      Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Friedman,
            J.; Gospodarowicz, D.; Fiddes, J.C.
#journal      EMBO J. (1986) 5:2523-2528
#title       Human basic fibroblast growth factor: nucleotide sequence and
            genomic organization.
#cross-references MUID:87053817
#accession    S00297
#status       not compared with conceptual translation
#molecule_type DNA
#residues     1-155 #label AB2
#note        the authors translated the codon GAA for residue 108 as
            Gly
REFERENCE     A54316
#authors      Shimoyama, Y.; Gotoh, M.; Ino, Y.; Sakamoto, M.; Kato, K.;
            Hirohashi, S.
#journal      Jpn. J. Cancer Res. (1991) 82:1263-1270
#title       Characterization of high-molecular-mass forms of basic
            fibroblast growth factor produced by hepatocellular
            carcinoma cells: possible involvement of basic fibroblast
            growth factor in hepatocarcinogenesis.
#cross-references MUID:92091228
#accession    A54316
#molecule_type protein
#residues     'XX',86-'X',90-91,'X',93-95 #label SH3
#experimental_source C-Li21 hepatocellular carcinoma cell line
#note        sequence extracted from NCBI backbone (NCBIP:71595)
#accession    B54316
#molecule_type protein
#residues     'XXX',19,'X',21-29 #label SH2
#note        sequence extracted from NCBI backbone (NCBIP:71594)
REFERENCE     A33624
#authors      Feige, J.J.; Bradley, J.D.; Fryburg, K.; Farris, J.; Cousens,
            L.C.; Barr, P.J.; Baird, A.
#journal      J. Cell Biol. (1989) 109:3105-3114
#title       Differential effects of heparin, fibronectin, and laminin on
            the phosphorylation of basic fibroblast growth factor by
            protein kinase C and the catalytic subunit of protein
            kinase A.
#cross-references MUID:90078343
#accession    A33624
#status       preliminary
#molecule_type protein
#residues     57-210 #label FEI
REFERENCE     A25824
#authors      Story, M.T.; Esch, F.; Shimasaki, S.; Sasse, J.; Jacobs,
            S.C.; Lawson, R.K.
#journal      Biochem. Biophys. Res. Commun. (1987) 142:702-709
#title       Amino-terminal sequence of a large form of basic fibroblast
            growth factor isolated from human benign prostatic
            hyperplastic tissue.

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#cross-references MUID:87156686
#accession A25824
#molecule_type protein
#residues 57-77 #label STO
#experimental_source prostate
REFERENCE
A90122
Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
Biochem. Biophys. Res. Commun. (1986) 135:541-548
#authors
#journal
#title
Human brain-derived acidic and basic fibroblast growth
factors: amino terminal sequences and specific mitogenic
activities.
#cross-references MUID:86186784
#accession B24243
#molecule_type protein
#residues 65-102, 'X', 104-105 #label GIM
#experimental_source brain
REFERENCE
A91364
Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
FEBS Lett. (1986) 204:203-207
#authors
#journal
#title
Partial molecular characterization of endothelial cell
mitogens from human brain: acidic and basic fibroblast
growth factors.
#cross-references MUID:86275260
#accession B24301
#molecule_type protein
#residues 65-88, 'X', 90-98, 'X', 100 #label GAU
REFERENCE
S42242
Sommer, A.; Brewer, M.T.; Thompson, R.C.; Moscatelli, D.;
Presta, M.; Rifkin, D.B.
Biochem. Biophys. Res. Commun. (1987) 144:543-550
#authors
#journal
#title
A form of human basic fibroblast growth factor with an
extended amino terminus.
#cross-references MUID:87213238
#accession S42242
#status preliminary
#molecule_type mRNA
#residues 54-210 #label SOM
#cross-references EMBL:M17599; NID:g183086; PIDN:AAA52534.1;
PID:g183087
REFERENCE
A55784
Pantoliano, M.W.; Horlick, R.A.; Springer, B.A.; Van Dyk,
D.E.; Tobery, T.; Wetmore, D.R.; Lear, J.D.; Nahapetian,
A.T.; Bradley, J.D.; Sisk, W.P.
Biochemistry (1994) 33:10229-10248
#authors
#journal
#title
Multivalent ligand-receptor binding interactions in the
fibroblast growth factor system produce a cooperative
growth factor and heparin mechanism for receptor
dimerization.
#cross-references MUID:94347757
#accession B55784
#molecule_type protein
#residues 54-71 #label PAN
REFERENCE
I52267
Watson, R.; Anthony, F.; Pickett, M.; Lambden, P.; Masson,
G.M.; Thomas, E.J.
Biochem. Biophys. Res. Commun. (1992) 187:1227-1231
#authors
#journal
#title
Reverse transcription with nested polymerase chain reaction
shows expression of basic fibroblast growth factor
transcripts in human granulosa and cumulus cells from in
vitro fertilisation patients.
#cross-references MUID:93038590
#accession I52267
#status preliminary; translated from GB/EMBL/DBJ
#molecule_type mRNA
#residues 95-182 #label RES
#cross-references GB:S47380; NID:g256535
#experimental_source granulosa cells
REFERENCE
S46253
Petry, V.; Bugler, B.; Amalric, F.; Prome, J.C.; Prats, H.
FEBS Lett. (1994) 349:23-28
#authors
#journal
#title
Purification and characterization of the 210-amino acid
recombinant basic fibroblast growth factor form (FGF-2).
#cross-references MUID:94320639

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#accession S46253
#molecule_type protein
#residues 39-53; 65-88 #label PAT
#note recombinant gene expressed in Escherichia coli
GENETICS
#gene GDB:FGF2; FGF2
#cross-references GDB:119910; OMIM:134920
#map_position 4q25-4q27
#start_codon CTG
CLASSIFICATION
#superfamily fibroblast growth factor
KEYWORDS
#alternative initiators; angiogenesis; growth factor; heparin
binding; mitogen
FEATURE
1-210 #product basic fibroblast growth factor, 22.5K form
65-210 #status predicted #label MA2\
#product basic fibroblast growth factor, 18K form
82-86 #status predicted #label MAT\
#region heparin binding #status predicted\
171-174 #region heparin binding #status predicted\
SUMMARY
#length 210 #molecular-weight 22623 #checksum 3610
Query Match 40.9%; Score 517; DB 2; Length 210;
Best Local Similarity 50.3%; Pred. No. 1.87e-87;
Matches 75; Conservative 30; Mismatches 42; Indels 2; Gaps 1;
Db 64 LPALPDGSGAFPDPKPKLYCKNGGFLRHPDGRVDGVREKSDPHIKLQQAEE 123
QY 26 VPSAGARANGTLLDANYKKPKLLYCSNGGHLRLPDPGTVDGTRDSQHLQLSAES 85
Db 124 RGWSIKGVANRYLAMKEDGRLLSKCVTDCFFERLESNNYTSRKYT--SWYVA 181
QY 86 VGEVYIKSTGTQYLANDTDGLLYGSQTPNECLFLERLEENHYNTYISKHAENWFG 145
Db 182 LKRTQYKLGSKTGPCQKAILFLPMSAKS 210
QY 146 LKNGSKRGPRTHYGQKAILFLPLVSS 174
RESULT 13
ENTRY A31674 #type complete
TITLE Basic fibroblast growth factor precursor - rat
ALTERNATE_NAMES bFGF
ORGANISM Rattus norvegicus #common_name Norway rat
DATE 21-May-1990 #sequence_revision 21-May-1990 #text_change 16-Jul-1999
ACCESSIONS A31674; S00876; S24309
REFERENCE A31674
#authors Shimasaki, S.; Emoto, N.; Koba, A.; Mercado, M.; Shibata, F.;
Cooksey, K.; Baird, A.; Ling, N.
#journal Biochem. Biophys. Res. Commun. (1988) 157:256-263
#title Complementary DNA cloning and sequencing of rat ovarian basic
fibroblast growth factor and tissue distribution study of
its mRNA.
#cross-references MUID:89061721
#accession A31674
#molecule_type mRNA
#residues 1-154 #label SHI
#cross-references GB:M22427; NID:g204285; PIDN:AAA1210.1; PID:g204286
REFERENCE S00876
#authors Kurokawa, T.; Seno, M.; Igarashi, K.
#journal Nucleic Acids Res. (1988) 16:5201
#title Nucleotide sequence of rat basic fibroblast growth factor
cDNA.
#cross-references MUID:88262516
#accession S00876
#molecule_type mRNA
#residues 1-154 #label KUR
#cross-references EMBL:X07295; NID:g56203; PIDN:CAA30265.1; PID:g56204
REFERENCE S24309
#authors El-Husseini, A.E.D.; Paterson, J.A.; Myal, Y.; Shiu, R.P.C.
#journal Biochim. Biophys. Acta (1992) 1131:314-316
#title PCR detection of the rat brain basic fibroblast growth factor
(bFGF) mRNA containing a unique 3' untranslated region.

```

```

TITLE      basic fibroblast growth factor - short-tailed opossum
            (Monodelphis domestica) (fragment)
ORGANISM   #formal_name Monodelphis domestica
DATE       20-Feb-1995 #sequence_revision 20-Feb-1995 #text_change
            12-Apr-1995
ACCESSIONS S31622
REFERENCE   S31622
#authors    Kusewitt, D.F.; Sabourin, C.L.K.; Budge, C.L.; Ley, R.D.
#submission submitted to the EMBL Data Library, September 1992
#description Characterization of cDNA encoding basic fibroblast growth
            factor of the marsupial Monodelphis domestica.
#accession  S31622
#status     preliminary
#molecule_type DNA
#residues   1-164 #label KUS
#cross-references EMBL:Z15154
CLASSIFICATION
#superfamily fibroblast growth factor
#length 164 #checksum 5156

Query Match      39.9%; Score 505; DB 2; Length 164;
Best Local Similarity 49.4%; Pred. No. 9,45e-85;
Matches 77; Conservative 28; Mismatches 48; Indels 3; Gaps

Db      12 GSITTPALSGDG-GGGAPPGHGFKPRLYKNGGFFLRTHPDGCRVDGIREKSDPNIK 70
      : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY      19 GLVGVHVVSPAGARNGILLDANKYKPLLKXCSNGHFLRLPLDGTVDGTRDSQHIQ 78
      : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :

Db      71 LQQAERGVSSTKVCANYALAMKEDGRLLALKYYTESCFPERLESNNYTYRSRKYS 130
      : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY      79 LQLSAESVSGEYVTKSTETGOYLAMDYDGLYGSQTPNEECFLERLEENHYNTYISKKHA 138
      : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :

Db      131 --NWYVALKRTGYKLGSKTGPQKAILFLPMSAKS 164
      : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY      139 EKNWFVGLKNGSKRGPRTHYQKAILFLPLPVSS 174
      : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :

Search completed: Tue Aug 29 15:44:12 2000
Job time : 34 secs.

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\*\*\*\*\*  
M A S R E H  
(TM)  
\*\*\*\*\*

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MPSrch\_pp protein - protein database search, using Smith-Waterman algorithm  
on: Tue Aug 29 15:41:17 2000; MasPar time 7.28 Seconds  
Tabular output not generated. 745.209 Million cell updates/sec

Title: >US-09-121-017B-3  
Description: (1-175) from US09121017B.pep  
Perfect Score: 1265  
Sequence: 1 MSRGAGRVQCTLQALVFLGV.....PRTHYGKAILFLPLPVSSD 175

Scoring table: PAM 150  
Gap 11

Searched: 85661 seqs, 30989116 residues

Post-processing: Minimum Match 0%  
Listing first 45 summaries

Database: swiss-prot38  
I:swissprot

Statistics: Mean 44.360; Variance 69.125; scale 0.642

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Description	ID	Pred. No.
1	986	77.9	HEPARIN-BINDING GROWTH	1 FGFL_HUMAN	2.42e-222
2	989	76.6	HEPARIN-BINDING GROWTH	1 FGFL_MSAU	8.20e-218
3	986	76.4	HEPARIN-BINDING GROWTH	1 FGFL_MOUSE	5.15e-217
4	955	75.5	HEPARIN-BINDING GROWTH	1 FGFL_PIG	4.39e-214
5	917	72.5	HEPARIN-BINDING GROWTH	1 FGFL_BOVIN	5.62e-204
6	916	72.4	HEPARIN-BINDING GROWTH	1 FGFL_CHICK	1.04e-203
7	530	41.9	HEPARIN-BINDING GROWTH	1 FGF2_CHICK	1.21e-102
8	524	41.4	HEPARIN-BINDING GROWTH	1 FGF2_BOVIN	4.17e-101
9	518	40.9	HEPARIN-BINDING GROWTH	1 FGF2_SHEEP	1.43e-99
10	517	40.9	HEPARIN-BINDING GROWTH	1 FGF2_HUMAN	2.58e-99
11	513	40.6	HEPARIN-BINDING GROWTH	1 FGF2_RAT	2.71e-98
12	508	40.2	HEPARIN-BINDING GROWTH	1 FGF2_MOUSE	5.13e-97
13	505	39.9	HEPARIN-BINDING GROWTH	1 FGF2_MONDO	2.99e-96
14	493	39.0	HEPARIN-BINDING GROWTH	1 FGF2_XENLA	3.42e-93
15	473	37.4	HEPARIN-BINDING GROWTH	1 FGF2_RABIT	4.13e-88
16	360	28.5	GLIA-ACTIVATING FACTOR	1 FGF9_XENLA	7.36e-60
17	350	27.7	GLIA-ACTIVATING FACTOR	1 FGF9_XENLA	2.09e-57
18	350	27.7	GLIA-ACTIVATING FACTOR	1 FGF9_HUMAN	2.09e-57
19	350	27.7	GLIA-ACTIVATING FACTOR	1 FGF9_MOUSE	2.09e-57
20	322	26.2	FIBROBLAST GROWTH FACT	1 FGF6_HUMAN	5.12e-53
21	327	25.8	FIBROBLAST GROWTH FACT	1 FGF6_RAT	8.37e-52
22	303	24.0	KERATINOCYTE GROWTH FA	1 FGF7_SHEEP	5.10e-46
23	300	23.7	KERATINOCYTE GROWTH FA	1 FGF7_HUMAN	2.66e-45

ALIGNMENTS

RESULT	1	STANDARD:	PRT:	155 AA.
ID	FGFL_HUMAN			
AC	P05230; P07502;			
DT	13-AUG-1987 (Rel. 05, Created)			
DT	13-AUG-1987 (Rel. 05, Last sequence update)			
DT	15-JUL-1999 (Rel. 38, Last annotation update)			
DE	HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF) (BETA-ENDOTHELIAL CELL GROWTH FACTOR) (ECGF-BETA).			
GN	FGF1 OR FGFA.			
OS	Homo sapiens (Human).			
OC	Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;			
OC	Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.			
RN	[1]			
RP	SEQUENCE FROM N.A.			
RX	MEDLINE; 86261805.			
RA	Jaye M., Howk R., Burgess W., Ricca G.A., Chiu I.-M., Ravera M.W., O'Brien S.J., Modi W.S., Maciag T., Drohan W.N.;			
RT	"Human endothelial cell growth factor: cloning, nucleotide sequence, and chromosome localization.";			
RL	Science 233:541-545(1986).			
RN	[2]			
RP	SEQUENCE FROM N.A.			
RC	TISSUE-BRAIN STEM;			
RX	MEDLINE; 89343957.			
RA	Wang W.P., Lehtoma K., Varban M.L., Krishnan I., Chiu I.M.;			
RT	"Cloning of the gene coding for human class I heparin-binding growth factor and its expression in fetal tissues.";			
RL	Mol. Cell. Biol. 9:2387-2395(1989).			
RN	[3]			
RP	SEQUENCE FROM N.A.			
RC	TISSUE-BRAIN STEM;			
RX	MEDLINE; 90265618.			
RA	Chiu I.M., Wang W.P., Lehtoma K.;			
RT	"Alternative splicing generates two forms of mRNA coding for human heparin-binding growth factor 1.";			
RL	Oncogene 5:755-762(1990).			
RN	[4]			
RP	SEQUENCE FROM N.A.			
RX	MEDLINE; 90073637.			
RA	Mergia A., Tischer E., Graves D., Tumolo A., Miller J., Gospodarowicz D., Abraham J.A., Shipley G.D., Fiddes J.C.;			
RT	"Structural analysis of the gene for human acidic fibroblast growth factor.";			
RL	Biochem. Biophys. Res. Commun. 164:1121-1129(1989).			
RN	[5]			
RP	SEQUENCE FROM N.A.			



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Matches 135; Conservative 1; Mismatches 2; Indels 0; Gaps 0;

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QY 38 LLDANYKPKLLYCSNGHFLRILPDGTVDGTRDSQDHIQQLSAESGVEYIKSTETG 97  
Db 78 QYLANDTDGLLYGSGTNPNECLFLERLEENHYNTYISKHAEKNFVGLKKNKSGCKRGPR 137  
QY 98 QYLANDTDGLLYGSGTNPNECLFLERLEENHYNTYISKHAEKNFVGLKKNKSGCKRGPR 157  
Db 138 THYGOKAILFLPLPVSSD 155  
QY 158 THYGOKAILFLPLPVSSD 175

RESULT 2  
FGFL\_MESAU STANDARD; PRT; 155 AA.  
P34004;  
01-FEB-1994 (Rel. 28, Created)  
01-FEB-1994 (Rel. 28, Last sequence update)  
15-JUL-1999 (Rel. 38, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST  
DE GROWTH FACTOR) (AFGF).  
GN FGFL OR FGF-1.  
OS Mesocricetus auratus (Golden hamster).  
OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Cricetinae;  
OC Mesocricetus.  
[1]  
SEQUENCE FROM N.A.  
RX MEDLINE; 90270291.  
RA Hall J.A., Harris M.A., Malark M., Mansson P.E., Zhou H., Harris S.E.;  
RT "Characterization of the hamster DDT-1 cell aFGF/HBGF-I gene and cDNA  
and its modulation by steroids."  
RL J. Cell. Biochem. 43:17-26(1990).  
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -!- SUBUNIT: MONOMER.  
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY  
THAN DOES BFGF.  
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
DR PIR; A60721; A60721.  
HSSP; P05230; 2AXM.  
PFAM; PF00167; FGF; 1.  
PRINTS; PR00262; ILHBGF.  
PRINTS; PR00263; HBGF.FGF.  
PROSITE; PS00247; HBGF.FGF; 1.  
KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
FT PROPEP 1 15  
FT CHAIN 16 155  
FT BINDING 24 116  
FT BINDING 113 116  
SQ SEQUENCE 155 AA; 17403 MW; 41E5EC760E412CC5 CRC64;

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Best Local Similarity 95.7%; Pred. No. 8.20e-218;  
Matches 132; Conservative 2; Mismatches 4; Indels 0; Gaps 0;

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QY 38 LLDANYKPKLLYCSNGHFLRILPDGTVDGTRDSQDHIQQLSAESGVEYIKSTETG 97  
Db 78 QYLANDTDGLLYGSGTNPNECLFLERLEENHYNTYISKHAEKNFVGLKKNKSGCKRGPR 137  
QY 98 QYLANDTDGLLYGSGTNPNECLFLERLEENHYNTYISKHAEKNFVGLKKNKSGCKRGPR 157  
Db 138 THYGOKAILFLPLPVSSD 155  
QY 158 THYGOKAILFLPLPVSSD 175

RESULT 3  
ID FGFL\_MOUSE STANDARD; PRT; 155 AA.  
AC P10935;  
DT 01-JUL-1989 (Rel. 11, Created)  
DT 01-JUL-1989 (Rel. 11, Last sequence update)  
DT 15-JUL-1999 (Rel. 38, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST  
DE GROWTH FACTOR) (AFGF).  
GN FGFL OR FGF-1 OR FGFA.  
OS Mus musculus (Mouse), and Rattus norvegicus (Rat).  
OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.  
[1]  
SEQUENCE FROM N.A.  
RX SPECIES=RAT;  
RX MEDLINE; 89240051.  
RA Goodrich S., Yan G.C., Bahrenburg K., Mansson P.E.;  
RT "The nucleotide sequence of rat heparin binding growth factor 1  
(HBGF-1)."  
RL Nucleic Acids Res. 17:2867-2867(1989).  
[2]  
SEQUENCE FROM N.A.  
RX SPECIES=MOUSE;  
RX MEDLINE; 90201563.  
RA Hebert J.M., Basilio C., Goldfarb M., Haub O., Martin G.R.;  
RT "Isolation of cDNAs encoding four mouse FGF family members and  
characterization of their expression patterns during embryogenesis."  
RL Dev. Biol. 138:454-463(1990).  
[3]  
SEQUENCE FROM N.A.  
RX SPECIES=MOUSE;  
RX MEDLINE; 97128312.  
RA Madiai F., Hackshaw K.V., Chiu I.M.;  
RT "Cloning and characterization of the mouse Fgf-1 gene."  
RL Gene 179:231-236(1996).  
[4]  
SEQUENCE FROM N.A.  
RX SPECIES=MOUSE; STRAIN=BALE/C;  
RX MEDLINE; 97094746.  
RA Alam K.Y., Frosthalm A., Hackshaw K.V., Evans J.E., Rotter A.,  
RA Chiu I.M.;  
RT "Characterization of the 1B promoter of fibroblast growth factor 1  
and its expression in the adult and developing mouse brain."  
RL J. Biol. Chem. 271:30263-30271(1996).  
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -!- SUBUNIT: MONOMER.  
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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CC  
CC EMBL; X14232; CAA32448.1;  
CC EMBL; M30641; AAA37618.1;  
CC EMBL; U36459; AAC52969.1;  
CC EMBL; U36457; AAC52969.1; JOINED.  
CC EMBL; U36458; AAC52969.1; JOINED.  
CC EMBL; U67610; AAC52907.1;  
CC PIR; S04147; SC4147.  
CC PIR; D37360; D37360.  
CC HSSP; P05230; 2AXM.  
CC MGD; MGI:95515; FGF1.  
CC PFAM; PF00167; FGF; 1.  
CC PRINTS; PR00262; ILHBGF.

DR PRINTS; PR00263; HBGFFGF.  
DR PROSITE; PS00247; HBGFFGF; 1.  
KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
FT PROPEP 1 15  
FT CHAIN 16 155 HEPARIN-BINDING GROWTH FACTOR 1.  
FT BINDING 24 28 HEPARIN (POTENTIAL).  
FT BINDING 113 116 HEPARIN (POTENTIAL).  
SQ SEQUENCE 155 AA; 17418 MW; 8880E4FF0FBA4161 CRC64;  
  
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Best Local Similarity 96.3%; Pred. No. 5.16e-217;  
Matches 130; Conservative 3; Mismatches 2; Indels 0; Gaps 0;  
  
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QY 41 ANYKKPKLLYCSNGGHFLRLPDGTVDGTRDSQDHIQLQLSAESVGEYVIKSTGTGVL 100  
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Db 81 AMDEGLLYGSGTPNEECFLERLEENHYNTYTSKKHAENWFVGLKNGSKRGPRTHY 140  
|||||  
101 AMDTGLLYGSGTPNEECFLERLEENHYNTYTSKKHAENWFVGLKNGSKRGPRTHY 160  
|||||  
141 GKXAILFLPLPVSSD 155  
|||||  
QY 161 GKXAILFLPLPVSSD 175  
|||||  
  
RESULT 4  
ID FGFL\_PIG STANDARD; PRT; 152 AA.  
AC P2002;  
DT 01-FEB-1991 (Rel. 17, Created)  
DT 01-FEB-1996 (Rel. 33, Last sequence update)  
DT 15-JUL-1999 (Rel. 38, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST  
DE GROWTH FACTOR) (AFGF) (ALPHA-ENDOTHELIAL CELL GROWTH FACTOR)  
DE (FRAGMENT).  
GN FGFL OR FGF-1.  
OS Sus scrofa (Pig).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Cetartiodactyla; Suidae; Sus.  
RN [1]  
RP SEQUENCE FROM N.A.  
RC TISSUE=HEART;  
RX MEDLINE; 92062117.  
RA Schmidt M., Sharma H.S., Schott R.J., Schaper W.;  
RT "Amplification and sequencing of mRNA encoding acidic fibroblast  
RT growth factor (afgf) from porcine heart";  
RL Biochem. Biophys. Res. Commun. 180:853-859(1991).  
RN [2]  
SEQUENCE OF 22-41.  
MEDLINE; 89231704.  
Quinkler W., Maasberg M., Bernotat-Danielowski S., Luethke N.,  
RA Sharma H.S., Schaper W.;  
RT "Isolation of heparin-binding growth factors from bovine, porcine and  
RT canine hearts";  
RL Eur. J. Biochem. 181:67-73(1989).  
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -!- SUBUNIT: MONOMER.  
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY  
CC THAN DOES BFGF.  
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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CC -----  
DR EMBL; X60317; CAA42869.1; -

DR PIR; S03954; S03954.  
DR HSSP; P05230; 2AXM.  
DR PFAM; PF00167; EGF; 1.  
DR PROSITE; PS00247; HBGFFGF; 1.  
KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
FT PROPEP 1 15  
FT CHAIN 16 >152 HEPARIN-BINDING GROWTH FACTOR 1.  
FT BINDING 22 >152 ENDOTHELIAL CELL GROWTH FACTOR ALPHA.  
FT BINDING 24 28 HEPARIN (POTENTIAL).  
FT BINDING 113 116 HEPARIN (POTENTIAL).  
FT CONFLICT 31 31 C -> S (IN REF. 2).  
FT CONFLICT 39 39 R -> Y (IN REF. 2).  
FT NON\_TER 152  
SQ SEQUENCE 152 AA; 17103 MW; A8533B0A92F9ABF4 CRC64;  
  
Query Match 75.5%; Score 955; DB 1; Length 152;  
Best Local Similarity 95.6%; Pred. No. 4.39e-214;  
Matches 129; Conservative 2; Mismatches 4; Indels 0; Gaps 0;  
  
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:|||||  
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVDGTRDSQDHIQLQLSAESVGEYVIKSTGTG 97  
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Db 78 QYLMAMTGLYSGTPNEECFLERLEENHYNTYTSKKHAENWFVGLKNGSKRGPR 137  
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QY 98 QYLMAMTGLYSGTPNEECFLERLEENHYNTYTSKKHAENWFVGLKNGSKRGPR 157  
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Db 138 THYGOKAILFLPLPV 152  
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QY 158 THYGOKAILFLPLPV 172  
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RESULT 5  
ID FGFL\_BOVIN STANDARD; PRT; 155 AA.  
AC P03968;  
DT 23-OCT-1986 (Rel. 02, Created)  
DT 01-MAR-1989 (Rel. 10, Last sequence update)  
DT 15-JUL-1999 (Rel. 38, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST  
DE GROWTH FACTOR) (AFGF) (PROSTATROPIN) (ENDOTHELIAL CELL GROWTH FACTOR  
DE BETA AND ALPHA CHAINS) (ACIDIC EYE-DERIVED GROWTH FACTOR II) (EDGF  
DE II).  
GN FGFL OR FGF-1 OR FGFA OR HBGF-1 OR AFGF.  
OS Bos taurus (Bovine).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;  
OC Bovidae; Bovinae; Bos.  
RN [1]  
RP SEQUENCE FROM N.A.  
RC TISSUE=RETINA;  
RX MEDLINE; 89083506.  
RA Halley C., Courtois Y., Laurent M.;  
RT "Nucleotide sequence of bovine acidic fibroblast growth factor cdna.";  
RL Nucleic Acids Res. 16:10913-10913(1988).  
RN [2]  
RP SEQUENCE FROM N.A.  
RC TISSUE=RETINA;  
RX MEDLINE; 89078619.  
RA Alterio J., Halley C., Brou C., Soussi T., Courtois Y., Laurent M.;  
RT "Characterization of a bovine acidic FGF cdna clone and its  
RT expression in brain and retina";  
RL FEBS Lett. 242:41-46(1988).  
RN [3]  
RP SEQUENCE OF 2-155.  
RX MEDLINE; 87016918.  
RA Burgess W.H., Mehlman T., Marshak D.R., Fraser B.A., Maciag T.;  
RT "Structural evidence that endothelial cell growth factor beta is the  
RT precursor of both endothelial cell growth factor alpha and acidic  
RT fibroblast growth factor";  
RL Proc. Natl. Acad. Sci. U.S.A. 83:7216-7220(1986).  
RN [4]  
RP SEQUENCE OF 2-155.  
RX MEDLINE; 87026586.







QY 146 LKKGSCCKRGPRTHYQGKAILFLPLPVSS 174

RESULT 9

ID	FGF2_SHEEP	STANDARD;	PRT;	155 AA.
AC	P20003;			
DT	01-FEB-1991	(Rel. 17, Created)		
DT	01-FEB-1996	(Rel. 33, Last sequence update)		
DT	01-FEB-1996	(Rel. 33, Last annotation update)		
DE	HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2)	(BASIC FIBROBLAST		
DE	GROWTH FACTOR) (HBGF) (PROSTATROPIN).			
DE	FGF2 OR FGF-2.			
GN	Ovis aries (Sheep).			
OC	Eukaryota; Metazoa; Chordata; Craniala; Vertebrata; Euteleostomi;			
OC	Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;			
OC	Bovidae; Caprinae; Ovis.			
RP	[1]			
RP	SEQUENCE FROM N.A.			
RP	Sutton R., Ward W.G., Raphael K.A., Cam G.R.;			
RP	Submitted (SEP-1994) to the EMBL/GenBank/DBJ databases.			
RP	[2]			
RP	SEQUENCE OF 9-155.			
RP	MEDLINE; 88055577.			
RX	Simpson R.J., Moritz R.L., Lloyd C.J., Fabri L.J., Nice E.C.,			
RA	Rubira M.R., Burgess A.W.;			
RA	"Primary structure of ovine pituitary basic fibroblast growth			
RT	factor";			
RT	FEBs Lett. 224:128-132(1987).			
RL	-!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS			
CC	IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN			
CC	VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND			
CC	CONCENTRATION OF THESE 2 GROWTH FACTORS.			
CC	-!- SUBUNIT: MONOMER.			
CC	-!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES			
CC	AFGF.			
CC	-!- SIMILARIY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY			
CC	-----			
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CC	or send an email to <a href="mailto:license@isb-sib.ch">license@isb-sib.ch</a> ).			
CC	-----			
CC	EMBL; L36136; AAA31519.1; .			
CC	PIR; S00185; S00185.			
DR	HSSP; P09038; 1BFF.			
CC	PFAM; PF00167; FGF. 1.			
CC	PRINTS; PR00262; ILIHGFG.			
DR	PRINTS; PR00263; HBGFFGF.			
DR	PROSITE; PS00247; HBGF_FGF; 1.			
KW	Growth factor; Mitogen; Vascularization; Heparin-binding.			
FT	PROPEP 1 9			
FT	CHAIN 10 155			
FT	SITE 45 48			
FT	SITE 87 90			
FT	BINDING 27 31			
FT	BINDING 116 119			
FT	SEQUENCE 155 AA; 17280 MW; B5F2364BA610606D CRC64.			
SQ				

127 LRTGQYKLGPKTGGQKAILFLPMSAKS 155  
||:| ||:| ||:|||||:|  
146 LKNGSCRGRPRTHYQKAILFLPLPVSS 174

RESULT 10  
ID FGF2\_HUMAN STANDARD; PRT; 155 AA.  
AC P09038;  
DT 01-NOV-1988 (Rel. 09, Created)  
DT DT 01-NOV-1988 (Rel. 09, Last sequence update)  
DT DT 01-NOV-1997 (Rel. 35, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST  
DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).  
GN FGF2 OR FGFb.  
OS Homo sapiens (Human).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.  
RN [1]  
RX SEQUENCE FROM N.A.  
RX MEDLINE; 87053817.  
RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Friedman J.,  
RA Gospodarowicz D., Fiddes J.C.;  
RT "Human basic fibroblast growth factor: nucleotide sequence and  
RT genomic organization.";  
RL EMBO J. 5:2523-2528(1986).  
RN [2]  
RX SEQUENCE FROM N.A.  
RX MEDLINE; 87217066.  
RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Fiddes J.C.;  
RT "Human basic fibroblast growth factor: nucleotide sequence, genomic  
RT organization, and expression in mammalian cells.";  
RL Cold Spring Harb. Symp. Quant. Biol. 51:657-668(1986).  
RN [3]  
RX SEQUENCE FROM N.A.  
RX MEDLINE; 87213238.  
RA Sommer A., Brewer M.T., Thompson R.C., Moscatelli D., Presta M.,  
RA Rifkin D.B.;  
RT "A form of human basic fibroblast growth factor with an extended  
RT amino terminus.";  
RL Biochem. Biophys. Res. Commun. 144:543-550(1987).  
RN [4]  
RX SEQUENCE FROM N.A.  
RX MEDLINE; 87162468.  
RA Kurokawa T., Sasada R., Ivane M., Igarashi K.;  
RT "Cloning and expression of cDNA encoding human basic fibroblast  
RT growth factor.";  
RL FEBS Lett. 213:189-194(1987).  
RN [5]  
RX SEQUENCE FROM N.A.  
RX MEDLINE; 89184522.  
RA Prats H., Kaghad M., Prats A.C., Klagsbrun M., Lelias J.M.,  
RA Liauzon P., Chalou P., Tauber J.P., Amalric F., Smith J.A.,  
RA Caput D.;  
RT "High molecular mass forms of basic fibroblast growth factor are  
RT initiated by alternative CUG codons.";  
RL Proc. Natl. Acad. Sci. U.S.A. 86:1836-1840(1989).  
RN [6]  
RX SEQUENCE OF 10-35.  
RX MEDLINE; 86275260.  
RA Gautschi P., Frater-Schroeder M., Boehlen P.;  
RT "Partial molecular characterization of endothelial cell mitogens from  
RT human brain: acidic and basic fibroblast growth factors.";  
RL FEBS Lett. 204:203-207(1986).  
RN [7]  
RX SEQUENCE OF 10-39.  
RX MEDLINE; 86186784.  
RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;  
RT "Human brain-derived acidic and basic fibroblast growth factors:  
RT amino terminal sequences and specific mitogenic activities.";  
RL Biochem. Biophys. Res. Commun. 135:541-548(1986).  
RN [8]  
RX SEQUENCE OF 2-22.  
RX PRT; 155 AA.





RESULT	11	STANDARD;	PRT;	154 AA.
ID	FGF2_RAT			
AC	PL3109;			
DT	01-JAN-1990 (Rel. 13, Created)			
DT	01-JAN-1990 (Rel. 13, Last sequence update)			
DT	15-JUL-1998 (Rel. 36, Last annotation update)			
DE	HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF) (PROSTATROPIN).			
DE	FGF2 OR FGF-2.			
GN	Rattus norvegicus (Rat).			
OS	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;			
OC	Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.			
CC	[1]			
CC	SEQUENCE FROM N.A.			
CC	STRAIN-SPRAGUE-DAWLEY; TISSUE-OVARY;			
CC	MEDLINE; 89061721.			
CC	Shimasaki S., Emoto N., Koba A., Mercado M., Shibata F.,			
CC	Cooksey K., Baird A., Ling N.;			
CC	"Complementary DNA cloning and sequencing of rat ovarian basic			
CC	fibroblast growth factor and tissue distribution study of its mRNA.";			
CC	Biochem. Biophys. Res. Commun. 157:256-263(1988).			
CC	[2]			
CC	SEQUENCE FROM N.A.			
CC	STRAIN-SPRAGUE-DAWLEY; TISSUE-TESTIS;			
CC	MEDLINE; 88262516.			
CC	Kurokawa T., Seno M., Igarashi K.;			
CC	"Nucleotide sequence of rat basic fibroblast growth factor cDNA.";			
CC	Nucleic Acids Res. 16:5201-5201(1988).			
CC	[3]			
CC	SEQUENCE OF 1-28 FROM N.A.			
CC	STRAIN-SPRAGUE-DAWLEY; TISSUE-TESTIS;			
CC	MEDLINE; 97200905.			
CC	Pasumarthi K.B.S., Jin Y., Cattini P.A.;			
CC	"Cloning of the rat fibroblast growth factor-2 promoter region and			
CC	its response to mitogenic stimuli in glioma C6 cells.";			
CC	J. Neurochem. 68:898-908(1997).			
CC	[4]			
CC	SEQUENCE OF 35-154 FROM N.A.			
CC	STRAIN-SPRAGUE-DAWLEY; TISSUE-BRAIN;			
CC	MEDLINE; 92329546.			
CC	El-Husseini A.E.D., Paterson J.A., Myal Y., Shiu R.P.C.;			
CC	"PCR detection of the rat brain basic fibroblast growth factor (bFGF)			
CC	mRNA containing a unique 3' untranslated region.";			
CC	Biochim. Biophys. Acta 1131:314-316(1992).			
CC	[5]			
CC	-1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS			
CC	IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN			
CC	VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND			
CC	CONCENTRATION OF THESE 2 GROWTH FACTORS.			
CC	-1- SUBUNIT: MONOMER.			
CC	-1- TISSUE SPECIFICITY: FOUND IN ALL THE TISSUES EXAMINED.			
CC	-1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES			
CC	AFGF.			
CC	-1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.			
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CC	or send an email to <a href="mailto:license@isb-sib.ch">license@isb-sib.ch</a> ).			
CC	EMBL; M22427; AAA41210.1; -			
CC	EMBL; X07285; CAA30265.1; -			
CC	EMBL; U78079; AAC53225.1; -			
CC	EMBL; X61697; CAA43863.1; -			
CC	PIR; S00876; S00876			
CC	PIR; A31674; A31674			
CC	HSP; P03036; IBEF.			
CC	PFAM; PF00167; FGF; 1.			
CC	PRINTS; PR00262; ILIHGF.			

Query Match 39.9%; Score 505; DB 1; Length 156;  
Best Local Similarity 49.4%; Pred. No. 2.99e-96;

Search completed: Tue Aug 29 15:41:43 2000  
Job time : 26 secs..

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RESULT      15
ID          FGF2_RABBIT STANDARD; PRRT 137 AA.
AC          P48799;
DT          01-FEB-1996 (Rel. 33, Created)
DI          01-FEB-1996 (Rel. 33, Last sequence update)
DD          01-FEB-1996 (Rel. 33, Last annotation update)
DE          HEPARIN-BINDING GROWTH FACTOR 2 (HBGF-2) (BASIC FIBROBLAST GROWTH
FA          FACTOR) (BFGE) (PROSTATROPIN) (FRAGMENT).
GN          FGF2.
OS          Oryctolagus cuniculus (Rabbit).
OC          Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC          Mammalia; Eutheria; Lagomorpha; Leporidae; Oryctolagus.
RN          [1]
RC          SEQUENCE FROM N.A.
RD          STRAIN=NEW ZEALAND WHITE; TISSUE=SMOOTH MUSCLE;
RE          MEDLINE; 93343209.
RX          Winkles J A., Friesel R., Alberts G.F., Janat M.F., Lian G.;
RT          "Elevated expression of basic fibroblast growth factor in an
RL          immortalized rabbit smooth muscle cell line.";
RM          Am. J. Pathol. 143:518-527(1993).
CC          -I- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC          IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC          VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC          CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC          -I- SUBUNIT: MONOMER.
CC          -I- SIMILARITY: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC          AFGE.
CC          -I- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
CC          -----
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CC          or send an email to license@isb-sib.ch).
CC          -----
EMBL; L12034; AAA31248.1; ..
DR          HSPG; P09038; IBFF.
DR          PFAM; PF00167; FGF; 1.
DR          PROSITE; PS00247; HBGF_FGF; 1.
KW          Growth factor; Mitogen; Vascularization; Heparin-binding.
FT          BINDING 18 22 HEPARIN (POTENTIAL).
FT          BINDING 107 110 HEPARIN (POTENTIAL).
FT          NON_TER 137 137
SQ          SEQUENCE 137 AA; 15418 MW; 0D9EE457B88EBC51 CRC64;

Query Match 37.4%; Score 473; DB 1; Length 137;
Best Local Similarity 50.4%; Pred.No. 4,13e-88;
Matches 70; Conservative 27; Mismatches 40; Indels 2; Gaps 1;

Db 1 PALPDGGSGAPPFGHFKDPKRLXCKNGGFLRHDPGRVDGVGREKSDPHIKLOQAEER 60
   | : :::: ::| ||||| ||||| ||||| ||||| ||||| |||||
Qy 27 PSPAGARANGTLLDANYKKPKLLXCNSGGHFRLRPDGTVDGTRDSRDOHQQLQLSAESV 86
   | | :::: ::| ||||| ||||| ||||| ||||| ||||| |||||
Db 61 GVVSITKGVCANRYLAMKREDGLLLASKCVTDSCFPERLESNNYTYISRKYS--SWYVAL 118
   | | :::: ::| ||||| ||||| ||||| ||||| ||||| |||||
Qy 87 GEVIKSTPETGOYLMDPTDGLLYGSQTNEECLELRLENHNHTYISKRAENKWFVL 146
   | | :::: ::| ||||| ||||| ||||| ||||| ||||| |||||
Db 119 KRTGOYKLGSKTGPQKAI 137

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Result No.	Query		ID	Description	Pred. No.
	Score	Match			
1	517	40.9	196	4 P78443	2 77e-95
2	511	40.4	130	6 O77757	8 18e-94
3	382	30.2	101	13 P79706	1 23e-62
4	346	27.4	146	13 Q70659	3 96e-54
5	313	24.7	115	11 Q60487	1 95e-46
6	306	24.2	212	13 Q42407	8 09e-45
7	302	23.9	194	6 P79150	6 75e-44
8	274	21.7	252	11 O89096	1 67e-37
9	267	21.1	60	4 Q16588	6 38e-36
10	266	21.0	59	4 Q16089	1 07e-35
11	264	20.9	70	11 O54837	3 02e-35
12	260	20.6	196	13 Q39H11	2 39e-34
13	257	20.3	243	13 Q39W61	2 39e-34
14	251	19.8	127	4 Q99517	1 13e-33
15	250	19.8	206	13 Q39G58	2 46e-32
16	248	19.6	192	4 Q95830	4 11e-32
17	248	19.6	245	13 Q39W62	1 15e-31
18	236	18.7	200	13 P79925	1 15e-31
19	226	17.9	425	5 Q76831	5 17e-29
20	225	17.8	74	6 O77561	8 02e-27
21	225	17.8	74	6 O77561	1 32e-26

Db 110 RGVYKIGVCANRYLAMKEDGRLLASKCVTDCFEFERLESNNYTSRKYT--SWYVA 167  
 QY 86 VGEVYKSTGTQGLAMDTDGLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFG 145

Db 168 LKRTQYKLGSKTGPQKAILFLPMSAKS 196  
 QY 146 LKNGSKRGPRTHYGOKAILFLPLPVSS 174

RESULT 2  
 ID Q7767 PRELIMINARY; PRT; 130 AA.  
 AC Q7767;  
 DT 01-NOV-1998 (Tremblrel. 08, Created)  
 DT 01-NOV-1998 (Tremblrel. 08, Last sequence update)  
 DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)  
 DE BASIC FIBROBLAST GROWTH FACTOR (FRAGMENT).  
 GN BFGF.

OS Canis familiaris (Dog).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
 OC Eutheria; Carnivora; Fissipedia; Canidae; Canis.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RC TISSUE=ADRENAL GLAND;  
 RA TROCHTA O.A., JACOBS R.M., LAMARRE J.;  
 RT "The role of bFGF in canine Hemangiosarcoma";  
 RL Submitted (APR-1998) to the EMBL/GenBank/DBJ databases.  
 DR EMBL; AF060562; AAC3912.1;  
 DR HSSP; P09038; 1BFF.  
 DR PROSITE; PS00247; HBGF\_FGF; 1.  
 DR PFAM; PF00167; FGF; 1.  
 FT NON\_TER 1 130  
 FT NON\_TER 130 130  
 SQ SEQUENCE 130 AA; 14902 MW; DB6A90A4 CRC32;

Query Match 40.4%; Score 511; DB 6; Length 130;  
 Best Local Similarity 55.3%; Pred. No. 8.18e-94;  
 Matches 73; Conservative 21; Mismatches 36; Indels 2; Gaps 1;

Db 1 FKDPKRLKNGGFFRIHPDGRVDGVRKSDPHVKLOQAERGVSIGVCANRYLAM 60  
 QY 43 YKPKLLYCSNGGHFLRILPDGTVDRSDQHILQLSAESVGEVYKSTGTGYLAM 102  
 Db 61 KEDGRLLASKCVTDCFEFERLESNNYTSRKYS--SWYVAKRTGQYKLGPKTGPQ 118  
 QY 103 DTGGLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFGVGLKNGSKRGPRTHYGQ 162  
 Db 119 KAILFLPMSAKS 130  
 QY 163 KAILFLPLPVSS 174

RESULT 3  
 ID P79706 PRELIMINARY; PRT; 101 AA.  
 AC P79706;  
 DT 01-MAY-1997 (Tremblrel. 03, Created)  
 DT 01-MAY-1997 (Tremblrel. 03, Last sequence update)  
 DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)  
 DE BASIC FGF (FRAGMENT).  
 OS Cynops pyrrhogaster (Japanese common newt).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Amphibia;  
 OC Batrachia; Caudata; Salamandridae; Salamandridae; Cynops.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RC TISSUE=EMBRYO;  
 RA SUZUKI A.S., TABATA T., SAKAGUCHI K., TAKABATAKE T., TAKESHIMA K.,  
 RA KANEDA T.;  
 RT "Serial expression of the genes in a mesodermatizing ectoderms of  
 early Cynops gastrula";  
 RL Submitted (NOV-1996) to the EMBL/GenBank/DBJ databases.  
 DR EMBL; D89443; BAAL3958.1;  
 DR HSSP; P09038; 2BFH.  
 DR PROSITE; PS00247; HBGF\_FGF; 1.

DR PFAM; PF00167; FGF; 1.  
 FT NON\_TER 1 101  
 FT NON\_TER 101 101  
 SQ SEQUENCE 101 AA; 11907 MW; 1CD93BB0 CRC32;  
 Query Match 30.2%; Score 382; DB 13; Length 101;  
 Best Local Similarity 53.4%; Pred. No. 1.23e-62;  
 Matches 55; Conservative 18; Mismatches 28; Indels 2; Gaps 1;

Db 1 PKRLYCKNGGFFLRINSQKVDGAREKSDYIKLOQAERGVSIGVCANRYLAMKDD 60  
 QY 46 PKLLYCSNGGHFLRILPDGTVDRSDQHILQLSAESVGEVYKSTGTGYLAMDTD 105

Db 61 GRMLALKWITDCFEFERLESNNYTSRKYS--WYVALKR 101  
 QY 106 GLLYGSQTPNEECFLERLEENHYNTYISKHAEKNWFGVGLKK 148

RESULT 4  
 ID Q07659 PRELIMINARY; PRT; 146 AA.  
 AC Q07659;  
 DT 01-NOV-1996 (Tremblrel. 01, Created)  
 DT 01-NOV-1996 (Tremblrel. 01, Last sequence update)  
 DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)  
 DE FIBROBLAST GROWTH FACTOR.  
 GN BFGF.  
 OS Gallus gallus (Chicken).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;  
 OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 93246053.  
 RA BORJA A.Z., ZELLER R., MEIJERS C.;  
 RT "Expression of alternatively spliced bFGF first coding exons and  
 RT antisense mRNAs during chicken embryogenesis";  
 RL Dev. Biol. 157:110-118(1993).  
 RN [2]  
 RP SEQUENCE OF 52-85 FROM N.A.  
 RX MEDLINE; 90382254.

RA MITRANI E., GRUENBAUM Y., SHOHAT H., ZIV T.;  
 RT "Fibroblast growth factor during mesoderm induction in the early chick  
 RT embryo";  
 RL Development 109:387-393(1990).  
 DR EMBL; M95706; AAA48616.1;  
 DR EMBL; X56804; CAA40139.1;  
 DR HSSP; P09038; 2BFH.  
 DR PROSITE; PS00247; HBGF\_FGF; 1.  
 DR PFAM; PF00167; FGF; 1.  
 DR PRINTS; PR00262; ILJHBGF.  
 SQ SEQUENCE 146 AA; 16182 MW; 44C5274B CRC32;

Query Match 27.4%; Score 346; DB 13; Length 146;  
 Best Local Similarity 48.1%; Pred. No. 3.96e-54;  
 Matches 50; Conservative 20; Mismatches 32; Indels 2; Gaps 1;

Db 45 ERVSAMVKLOQAERGVSIGVSRANRELAMKEDGRLLALKCAEECFERLESNNYN 104  
 QY 71 DRSDQHILQLSAESVGEVYKSTGTGYLAMDTGGLYGSQTPNEECFLERLEENHYN 130  
 Db 105 TYRSRKYS--WYVALKRTGQYKPGPKTGPQKAILFLPMSAKS 146  
 QY 131 TYISKHAEKNWFGVGLKNGSKRGPRTHYGOKAILFLPLPVSS 174

Query Match 27.4%; Score 346; DB 13; Length 146;  
 Best Local Similarity 48.1%; Pred. No. 3.96e-54;  
 Matches 50; Conservative 20; Mismatches 32; Indels 2; Gaps 1;

Db 45 ERVSAMVKLOQAERGVSIGVSRANRELAMKEDGRLLALKCAEECFERLESNNYN 104  
 QY 71 DRSDQHILQLSAESVGEVYKSTGTGYLAMDTGGLYGSQTPNEECFLERLEENHYN 130  
 Db 105 TYRSRKYS--WYVALKRTGQYKPGPKTGPQKAILFLPMSAKS 146  
 QY 131 TYISKHAEKNWFGVGLKNGSKRGPRTHYGOKAILFLPLPVSS 174

RESULT 5  
 ID Q60487 PRELIMINARY; PRT; 115 AA.  
 AC Q60487;  
 DT 01-NOV-1996 (Tremblrel. 01, Created)  
 DT 01-NOV-1996 (Tremblrel. 01, Last sequence update)  
 DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)  
 DE BASIC FIBROBLAST GROWTH FACTOR (FRAGMENT).  
 OS Cavia porcellus (Guinea pig).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;

OC Eutheria; Rodentia; Hystricognathi; Caviidae; Cavia.  
[1]  
RN SEQUENCE FROM N.A.  
RP TISSUE=PROSTATE;  
RA RICCIARDELLI C.;  
RL Submitted (JAN-1996) to the EMBL/GenBank/DBJ databases.  
DR EMBL; L75974; AA85394.1; -;  
DR HSP; P09038; 2BFH.  
DR PROSITE; PS00247; HBG\_FGF; 1.  
DR PFAM; PF00167; FGF; 1.  
ET NON\_TER  
SQ SEQUENCE 115 AA; 13495 MW; 4B12914A CRC32;

Query Match 24.7%; Score 313; DB 11; Length 115;  
Best Local Similarity 44.6%; Pred. No. 1.95e-46;  
Matches 45; Conservative 22; Mismatches 31; Indels 3; Gaps 2;  
Db 1 GFFLIHDPGRVDGVRKTDPIKINFPKPA-EELCYGGSLSNRYLANKEGRLLASKCV 59  
55 GFFLIHDPGRVDGVRKTDPIKINFPKPA-EELCYGGSLSNRYLANKEGRLLASKCV 114  
60 TDECFERLENNYNTYRSKYS--SWVALKRTGYKLG 98  
115 NEEDFLERLENNYNTYRSKYS--SWVALKRTGYKLG 155

RESULT 6  
ID O42407 PRELIMINARY; PRT; 212 AA.  
AC O42407;  
DT 01-JAN-1998 (Tremblrel. 05, Created)  
DT 01-JUN-1998 (Tremblrel. 06, Last sequence update)  
DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)  
DE FIBROBLAST GROWTH FACTOR 10.  
OS Gallus gallus (Chicken).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;  
OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.  
[1]  
RN SEQUENCE FROM N.A.  
RP MEDLINE: 97330690.  
RA OHUCHI H., NAKAGAWA T., YAMAMOTO A., ARAGA A., OHTA T., ISHIMARU Y.,  
RA YOSHIOKA H., KUWANA T., NOHNO T., YAMASAKI M., ITOH N., NOJI S.;  
RT "The mesenchymal factor, FGF10, initiates and maintains the outgrowth  
of the chick limb bud through interaction with FGF8, an apical  
ectodermal factor."  
RL Development 124:2235-2244(1997).  
DR EMBL; D86333; BRA24945.1; -;  
DR HSP; P03968; IBAR.  
DR PFAM; PF00167; FGF; 1.  
DR PRINTS; PRO0263; HBGFFGF.  
SQ SEQUENCE 212 AA; 23631 MW; C8AB1883 CRC32;

Query Match 24.2%; Score 306; DB 13; Length 212;  
Best Local Similarity 37.7%; Pred. No. 8.09e-45;  
Matches 57; Conservative 32; Mismatches 57; Indels 5; Gaps 5;

Db 64 PSSAGRHVSRVNHLOGDVRRKRL-Y-SYKVFLEKNGKVGSTKENCPSILITISVE 121  
QY 27 PSPAGARANG-TLLDANKKPKLLYCSNGHFLRILPDGTVGTRDRSDQHIQLQLSAES 85  
Db 122 IGVAVKSISNYILAMNKGKVGSKFNSDCKLKERIEENGNYNTYASLNKWHNGRQMF 181  
QY 86 VGEVYIKSTETGOYLAMTDGLLYGSQTPNEBCLFLERLENNYNTYIS-K-KHAEKNWF 143  
Db 182 VALNGRGATKRCQKTRKNTSAHFLPMVMS 212  
QY 144 VGLKNGSKRGPRTHYGOKAILFLPLVSS 174

RESULT 7  
ID P79150 PRELIMINARY; PRT; 194 AA.  
AC P79150;  
DT 01-MAY-1997 (Tremblrel. 03, Created)  
DT 01-MAY-1997 (Tremblrel. 03, Last sequence update)

DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)  
DE KERATINOCYTE GROWTH FACTOR.  
OS Canis familiaris (Dog).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
OC Eutheria; Carnivora; Fissipedia; Canidae; Canis.  
[1]  
RN SEQUENCE FROM N.A.  
RP MEDLINE: 96226403.  
RA CANATAN H., CHANG W.Y., SUGIMOTO Y., SHIDAIFAT F., KULP S.K.,  
RA BRUEGEMEIER R.W., LIN Y.C.;  
RT "Keratinocyte growth factor (KGF/FGF-7) has a paracrine role in canine  
prostate: molecular cloning of mRNA encoding canine KGF."  
RL DNA Cell Biol. 15:247-254(1996).  
DR EMBL; U80800; AAB38972.1; -;  
DR HSP; P05230; 2AFG.  
DR PROSITE; PS00247; HBG\_FGF; 1.  
DR PFAM; PF00167; FGF; 1.  
DR PRINTS; PRO0262; ILIHGFG.  
DR PRINTS; PRO0263; HBGFFGF.  
SQ SEQUENCE 194 AA; 22476 MW; 2B71A8ED CRC32;

Query Match 23.9%; Score 302; DB 6; Length 194;  
Best Local Similarity 35.8%; Pred. No. 6.75e-44;  
Matches 49; Conservative 33; Mismatches 52; Indels 3; Gaps 3;  
Db 59 MEGDIRVRLFCRTQ-WYLRIDKRGKVGKQEMKNSYNIMEIRTVAVGIVAIKGVSEY 117  
QY 39 LDANYKPKLLYCSNGHFLRILPDGTVGTRDRSDQHIQLQLSAESVGEVYIISTETGQ 98  
Db 118 YLANMKEGKIYAKKEDCNFKELILENHYNTYASAKWTHSGGEMFVALNKGQVVRGK 177  
QY 99 YLAMTDGLLYGSQTPNEBCLFLERLENNYNTYIS-K-KHAEKNWFVGLKNGSKRGP 156  
Db 178 KTKKEQKTAHFLPMAIT 194  
QY 157 RTHYGOKAILFLPLVPS 173

RESULT 8  
ID O89096 PRELIMINARY; PRT; 252 AA.  
AC O89096;  
DT 01-NOV-1998 (Tremblrel. 08, Created)  
DT 01-NOV-1998 (Tremblrel. 08, Last sequence update)  
DT 01-NOV-1999 (Tremblrel. 12, Last annotation update)  
DE FHF-4B.  
OS Rattus norvegicus (Rat), and Mus musculus (Mouse).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
OC Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.  
[1]  
RN SEQUENCE FROM N.A.  
RP TISSUE=BRAIN.  
RX MEDLINE: 98267141.  
RA YAMAMOTO S., MIKAMI T., OHBAYASHI N., OHTA M., ITOH N.;  
RT "Structure and expression of a novel isoform of mouse FGF homologous  
factor (FHF)-4."  
RL Biochim. Biophys. Acta 1398:38-41(1998).  
DR EMBL; AB008908; BAA31544.1; -;  
DR EMBL; AB008907; BAA31543.1; -;  
DR HSP; P03968; IBAR.  
DR PROSITE; PS00247; HBG\_FGF; 1.  
DR PFAM; PF00167; FGF; 1.  
SQ SEQUENCE 252 AA; 28364 MW; 1DFD5B4B CRC32;

Query Match 21.7%; Score 274; DB 11; Length 252;  
Best Local Similarity 37.5%; Pred. No. 1.67e-37;  
Matches 48; Conservative 26; Mismatches 49; Indels 5; Gaps 3;  
Db 80 LYCRQG-YYLQMHDPDGDGTDKDDSTNLFNLPVGLRVVAIOGVKTGLYIANNGEYL 138  
QY 49 LYCSNGGHFLRILPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETGOYLAMTDGLL 108  
Db 139 YPSELFTECKFKESVFENYVYSSMLYRQESGRAFWFLGNKEGQVMKG:RVKTKPA 198

1



Search completed: Tue Aug 29 15:43:21 2000  
Job time : 80 secs.



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msrch\_pp protein - protein database search, using Smith-Waterman algorithm  
on: Tue Aug 29 15:48:28 2000; MasPar time 6.87 Seconds  
Regular output not generated. 624.017 Million cell updates/sec

Title: >US-09-121-017B-5  
Description: (1-181) from US09121017B.pep  
Perfect Score: 1300  
Sequence: 1 MSRGAGRVQGTQALVELGV.....PRTHYGOKAILFLPLPVSSD 181

Scoring table: PAM 150  
Gap 11

Searched: 188963 seqs, 23686106 residues

Post-processing: Minimum Match 0%  
Listing first 45 summaries

Database: a-geneseq36  
1:geneseqp

Statistics: Mean 31.461; Variance 128.544; scale 0.245

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Match	Length	ID	Description	Pred. No.
1	920	70.8	140	1	Human acidic fibroblas	6.60e-81
2	920	70.8	140	1	Human acidic fibroblas	6.60e-81
3	920	70.8	140	1	Human acid fibroblast	6.60e-81
4	920	70.8	140	1	Human recombinant aFGF	6.60e-81
5	920	70.8	140	1	Human acidic fibroblas	6.60e-81
6	920	70.8	140	1	Sequence of human prot	6.60e-81
7	920	70.8	141	1	Human acidic fibroblas	6.60e-81
8	920	70.8	151	1	Human aFGF encoded by	6.60e-81
9	920	70.8	154	1	Human beta-endothelial	6.60e-81
10	920	70.8	154	1	Human beta-endothelial	6.60e-81
11	920	70.8	154	1	Human endothelial cell	6.60e-81
12	920	70.8	154	1	Human beta-endothelial	6.60e-81
13	920	70.8	155	1	Human acidic fibroblas	6.60e-81
14	920	70.8	155	1	FGF-1.	6.60e-81
15	920	70.8	155	1	Sequence encoded by co	6.60e-81
16	920	70.8	155	1	Fibroblast growth fact	6.60e-81
17	920	70.8	155	1	Fibroblast growth fact	6.60e-81
18	920	70.8	155	1	Fibroblast growth fact	6.60e-81
19	920	70.8	155	1	Human endothelial cell	6.60e-81
20	920	70.8	155	1	Human endothelial cell	6.60e-81
21	920	70.8	155	1	Human BECGF encoded by	6.60e-81
22	920	70.8	168	1	Human endothelial cell	6.60e-81
23	917	70.5	134	1	Human alpha-endothelia	1.35e-80

ALIGNMENTS

RESULT	1	
ID	R25914	standard; peptide; 140 AA.
AC	R25914;	
DT	26-JAN-1993	(first entry)
DE	Human acidic fibroblast growth factor.	
KW	viral infections; viruses; FGF; herpes simplex virus; HSV-1; HSV-2;	
KW	herpes varicella; herpes zoster; cytomegalovirus; influenza;	
KW	human respiratory syncytial virus; Semliki Forest virus; HIV;	
KW	human immunodeficiency virus; Moloney Sarcoma virus.	
OS	Homo sapiens.	
PN	EP-497341-A.	
PD	05-AUG-1992.	
PF	30-JAN-1992; 101541.	
PR	31-JAN-1991; GB-002145.	
PR	09-JAN-1992; GB-000410.	
PA	(FARM) FARMITALIA ERBA SRL CARLO.	
PI	Battistini C, Carminati P, Garofano L, Mazue G, Ungheri D;	
DR	WPI; 92-260792/32.	
PT	Synergistic antiviral composition contains BFGE and sulphated	
PT	polysaccharide - for treating viral infections e.g. HSV-1 and -2,	
PT	cytomegalovirus, HIV, influenza virus etc.	
PS	Disclosure; Page 4; 20pp; English.	
CC	This sequence represents acidic fibroblast growth factor (aFGF).	
CC	aFGF, or its fragments may be used in a synergistic compsn. with an	
CC	antivirally active sulphated polysaccharide, and one or more	
CC	excipients. The compsn. may be used to control herpes simplex virus	
CC	(HSV-1 or -2) herpes varicella/zoster; cytomegalovirus; influenza;	
CC	human respiratory syncytial virus; Semliki Forest virus; HIV or	
CC	Moloney Sarcoma virus. The combination of aFGF with sulphated	
CC	polysaccharide is found to have a greater antiviral activity than	
CC	expected for an additive effect. See also R25913-5.	
SQ	Sequence 140 AA;	
Query Match	70.8%;	Score 920; DB 1; Length 140;
Best Local Similarity	93.8%;	Pred. No. 6.60e-81;
Matches	135; Conservative 1;	Mismatches 2; Indels 6; Gaps 1;
Db	3	LPPGNYKPKLLYCSNGHFLRLPDGVTGTRDSQHIQLQLSAEVGEVYIKSTETG 62
Qy	38	LLDANYKKPKLLYCSNGHFLRLPDGVTGTRDSQHIQLQLSAEVGEVYIKSTETG 97
Db	63	QYLANDTGILYGSQTPNEECFLERLEE-----NHYTYISKHAEKNFVGLKNGS 116
Qy	98	QYLANDTGILYGSQTPNEECFLERLEEATPAPNHYTYISKHAEKNFVGLKNGS 157
Db	117	CKRGPRTHYGOKAILFLPLPVSSD 140

QY 158 CKRGRTHYGOKAILFLPLPVSSD 181

## RESULT 2

ID R34497 standard; protein; 140 AA.  
AC R34497;  
DE Human acidic fibroblast growth factor.  
KW aFGF; mutagen; glycosylation site; glycoprotein.  
OS Homo sapiens.  
PN J05076336-A.  
PD 30-MAR-1993.  
PF 30-MAY-1991; 127435.  
PR 31-MAY-1990; JP-143388.  
PA (TAKE ) TAKEDA CHEM IND LTD.  
DR WPI; 93-139564/17.

PT FGF mutagen prep. useful for therapy of burn or thrombosis - by transformation of lymphocyte-contained animal cell by vector contg. DNA encoding FGF mutagen.  
PS Disclosure; Page 3; 23pp; Japanese.  
CC The invention covers mutants of FGF (esp. bFGF) which contain at least one glycosylation site. The mutants can be used to treat burns and thrombosis.  
SQ Sequence 140 AA;

Query Match 70.8%; Score 920; DB 1; Length 140;  
Best Local Similarity 93.8%; Pred. No. 6.60e-81;  
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db 3 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 62  
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 97

Db 63 QYLANDTDGLLYGSQTPNEECFLERLEE-----NHYNTYISKHAEKNWFVGLKKNKS 116  
QY 98 QYLANDTDGLLYGSQTPNEECFLERLEEATPAPNHYNTYISKHAEKNWFVGLKKNKS 157

Db 117 CKRGRTHYGOKAILFLPLPVSSD 140  
QY 158 CKRGRTHYGOKAILFLPLPVSSD 181

## RESULT 3

ID P90068 standard; protein; 140 AA.  
AC P90068;  
DE 1-NOV-1989 (first entry)  
KW Human acidic fibroblast growth factor  
OS Homo sapiens  
PN EP-319052-A.  
PD 14-JUN-1989.  
PF 14-OCT-1988; 202306.  
PR 22-OCT-1987; EP-244431.  
PA (MERI) Merck and Co.  
PI Thomas Jnr KA, Linemeyer DL;  
DR WPI; 89-167092/23.

PT Mutant acidic fibroblast growth factor  
PT - used for promoting repair of soft tissue, musculoskeletal tissue or vascular or nerve tissue and plasminogen activator prodn.  
PS Disclosure; page 4; 36pp; English.  
CC Amino acid sequence of human acidic fibroblast growth factor (aFGF). The patent claims mutant forms which have increased biological activity with(out) heparin, and promote cell growth.

CC  
CC  
CC  
SQ Sequence 140 AA;

Query Match 70.8%; Score 920; DB 1; Length 140;  
Best Local Similarity 93.8%; Pred. No. 6.60e-81;  
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db 3 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 62  
QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 97

QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 97

Db 63 QYLANDTDGLLYGSQTPNEECFLERLEE-----NHYNTYISKHAEKNWFVGLKKNKS 116  
QY 98 QYLANDTDGLLYGSQTPNEECFLERLEEATPAPNHYNTYISKHAEKNWFVGLKKNKS 157

Db 117 CKRGRTHYGOKAILFLPLPVSSD 140

QY 158 CKRGRTHYGOKAILFLPLPVSSD 181

## RESULT 4

ID R74647 standard; protein; 140 AA.  
AC R74647;  
DE 25-SEP-1995 (first entry)  
KW Human recombinant aFGF.  
KW Acidic fibroblast growth factor; aFGF; vulnery; angiogenesis; mitogen.  
OS Homo sapiens.  
PN US5401832-A.  
PD 28-MAR-1995; 685923.  
PF 24-DEC-1984; US-685923.  
PR 12-SEP-1985; US-774359.  
PR 30-MAY-1986; US-868473.  
PR 11-JUL-1986; US-884460.  
PR 04-JUN-1987; US-054991.  
PR 04-MAY-1988; US-190293.  
PR 08-FEB-1991; US-654397.  
PR 25-SEP-1991; US-765472.  
PR 25-SEP-1992; US-951365.  
PA (MERI) MERCK & CO INC.

PI Gimenez-Gallego G, Kelly LJ, Linemeyer DL, Thomas KA;  
PI WPI; 95-136983/18.  
PT New recombinant human acidic fibroblast growth factor - used to promote cell growth, to promote wound healing, for vascular grafts and blood vessel repair  
PT Claim 2; Column 30; 25pp; English.  
CC Oligonucleotides were synthesized on the basis of the amino acid sequence of bovine acidic fibroblast growth factor (aFGF) and used to produce a synthetic gene (given in Q88233) incorporating CC codons preferred by E. coli or mammalian cells, unique cloning CC sites, etc. This synthetic gene was mutagenized to obtain a gene CC encoding a human recombinant aFGF (R74647) having activity CC equivalent to the native protein.  
SQ Sequence 140 AA;

Query Match 70.8%; Score 920; DB 1; Length 140;  
Best Local Similarity 93.8%; Pred. No. 6.60e-81;  
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db 3 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 62

QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVIKSTETG 97

Db 63 QYLANDTDGLLYGSQTPNEECFLERLEE-----NHYNTYISKHAEKNWFVGLKKNKS 116  
QY 98 QYLANDTDGLLYGSQTPNEECFLERLEEATPAPNHYNTYISKHAEKNWFVGLKKNKS 157

Db 117 CKRGRTHYGOKAILFLPLPVSSD 140

QY 158 CKRGRTHYGOKAILFLPLPVSSD 181

## RESULT 5

ID W04806 standard; protein; 140 AA.  
AC W04806;  
DE 29-DEC-1996 (first entry)  
KW Human acidic fibroblast growth factor.  
KW Endothelial cell growth factor; ECGF; blood vessel; regeneration; heparin-Sepharose affinity chromatography; probe; oligonucleotide;  
KW FGF; fibroblast growth factor; ss.  
OS Homo sapiens.

PN US552528-A.  
 PD 03-SEP-1996. 835594.  
 PR 03-MAR-1986; US-835594.  
 PR 18-DEC-1987; US-134499.  
 PR 29-APR-1991; US-693079.  
 PR 27-NOV-1991; US-799859.  
 PR 03-NOV-1994; US-334884.  
 PA (RHON ) RHONE POULENC RORER PHARM INC.  
 PI Burgess W. Maciag T;  
 DR WPI: 96-412132/41.  
 DR N-PSDB; T37503.  
 PT Isolated, purified, biologically active bovine beta endothelial cell  
 PT growth factor - useful to regenerate or treat damaged blood vessels  
 PS Disclosure; Fig 8: 28pp; English.  
 CC Bovine beta-endothelial cell growth factor (beta-ECGF; W03999) having  
 CC a mol.wt. of 20 kD can be purified at least 16300 fold from bovine  
 CC brain using heparin-Sepharose affinity chromatography. ECGF is  
 CC useful for, among other purposes, diagnostic applications and has  
 CC potential in the treatment of damaged blood vessels or other  
 CC endothelial cell-lined structures.  
 CC Human ECGF (T37503) or fragments may be obtained using  
 CC oligonucleotides (T37504 and T37508 to T37509) whose design is based  
 CC on the sequence of bovine alpha- and beta-ECGF.  
 SQ Sequence 140 AA;

Query Match 70.8%; Score 920; DB 1; Length 140;  
 Best Local Similarity 93.8%; Pred. No. 6.60e-81;  
 Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db 3 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 62  
 QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97

Db 63 QYLANDTGLLYGSQTPNEECFLERLEE-----NHNTYISKHAEKNWVGLKKNKS 116  
 QY 98 QYLANDTGLLYGSQTPNEECFLERLEEATPAPNHNTYISKHAEKNWVGLKKNKS 157

Db 117 CKRGPRTHYGOKAILFLPLPVSSD 140  
 QY 158 CKRGPRTHYGOKAILFLPLPVSSD 181

RESULT 6  
 ID P70995 standard; protein; 140 AA.  
 AC P70995;  
 DT 13-JUN-1991 (first entry)  
 DE Sequence of human proteinaceous factor (pF1) with mitogenic activity.  
 DE Cell growth promoter; mitogen; vascularisation; wound healing.  
 DE Homo sapiens.  
 FT misc\_difference 140  
 FT key Location/Qualifiers  
 FT misc\_difference 140 /label= Asp-OH

PN EP-241136-A.  
 PD 14-OCT-1987.  
 PF 06-MAR-1987; 301969.  
 PR 07-MAR-1986; US-838096.  
 PA (HARD ) HARVARD COLLEGE.  
 PI Lobb RR, Harper JW, Strydom DJ;  
 DR WPI: 87-285995/41.  
 PT Mitogenic polypeptide isolated from human brain tissue - useful  
 PT for increasing vascular effect in eg wound healing, or  
 PT generating endothelial cell linings for vascular prostheses, etc.  
 PS Claim 3; Page 1; 31pp; English.  
 CC The PF of the invention was obtd. from human brain tissue. It has a  
 CC mol. wt. of 15,200-16,500 (pref. 15,616-16,056) and has a high  
 CC affinity for heparin. PF1 and fragments are useful for promoting the  
 CC growth of mesoderm-derived cells or neuroectoderm-derived cells and  
 CC generating endothelial cell linings for vascular prostheses (all  
 CC claimed). The polypeptides are useful for increasing vascularisation.  
 SQ Sequence 140 AA;

Query Match 70.8%; Score 920; DB 1; Length 140;

Best Local Similarity 93.8%; Pred. No. 6.60e-81;  
 Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db 3 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 62  
 QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97

Db 63 QYLANDTGLLYGSQTPNEECFLERLEE-----NHNTYISKHAEKNWVGLKKNKS 116  
 QY 98 QYLANDTGLLYGSQTPNEECFLERLEEATPAPNHNTYISKHAEKNWVGLKKNKS 157

Db 117 CKRGPRTHYGOKAILFLPLPVSSD 140  
 QY 158 CKRGPRTHYGOKAILFLPLPVSSD 181

RESULT 7  
 ID R10527 standard; Protein; 141 AA.  
 AC R10527;  
 DT 15-APR-1991 (first entry)  
 DE Human acidic fibroblast growth factor gene.  
 DE aFGF; antibody; antigen; cancer; ss.  
 KW Homo sapiens.  
 FH key Location/Qualifiers  
 FT region 2..12  
 FT /label= A  
 FT region 56..67  
 FT /label= B  
 FT region 104..114  
 FT /label= C  
 FT region 132..141  
 FT /label= D

PN J02306996-A.  
 PD 20-DEC-1990.  
 PF 03-JUL-1989; 172542.  
 PR 04-JUL-1988; JP-166275.  
 PR 03-JUL-1989; JP-172542.  
 PA (TAKE ) TAKEDA CHEMICAL IND KK.  
 DR WPI: 91-040150/06.  
 DR N-PSDB; Q10399.  
 PT Anti-acid antibody, for cancer diagnosis, etc. - is obtd. by  
 PT using complex of partial peptide(s) of acid fibroblast growth  
 PT factor and protein as antigen.  
 PS Disclosure; Fig 1; 19pp; Japanese.  
 CC The was deduced from a gene used to produce recombinant aFGF.  
 CC Peptides derived from the protein, esp. from A-D can be used to as  
 CC antigens to produce anti-aFGF antibodies. The peptides must  
 CC comprise 8-10 continuous AAs from A or B (claims 5 and 6 resp.),  
 CC 7-10 continuous AAs from C (claim 7), or 8-9 continuous AAs from D  
 CC (claim 8). The Abs can be used for immunochemically measuring aFGF,  
 CC and for purifying aFGF. They are useful as reagents in the diag-  
 CC nosis of various cancers or diseases of the CNS. Purified aFGF  
 CC has wound healing and nerve cell proliferating properties.  
 SQ Sequence 141 AA;

Query Match 70.8%; Score 920; DB 1; Length 141;  
 Best Local Similarity 93.8%; Pred. No. 6.60e-81;  
 Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db 4 LPPGNYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 63  
 QY 38 LLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGEVYIKSTETG 97

Db 64 QYLANDTGLLYGSQTPNEECFLERLEE-----NHNTYISKHAEKNWVGLKKNKS 117  
 QY 98 QYLANDTGLLYGSQTPNEECFLERLEEATPAPNHNTYISKHAEKNWVGLKKNKS 157

Db 118 CKRGPRTHYGOKAILFLPLPVSSD 141  
 QY 158 CKRGPRTHYGOKAILFLPLPVSSD 181

RESULT 8

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ID R05789 standard; Protein; 151 AA.
AC R05789;
DT 22-APR-1990 (first entry)
DE Human arGF encoded by synthetic gene.
KW Acidic fibroblast growth factor; arGF; thrombogenesis;
KW atherosclerosis; tumors.
OS Synthetic.
FH Key
FT misc_difference 146..147
FT /note= "sites corresp. to two stop codons of
FT the DNA sequence"
PN GB2223496-A.
PD 11-APR-1990.
PR 08-AUG-1988; 018775.
PR 08-AUG-1988; GB-018775.
PA (BRBI-) Brit Bio-Tech Ltd.
PI Davies JA, Johnson ID;
PI WPI; 90-109882/15.
DR N-PSDB; Q03873.
DE Gene encoding human acidic fibroblast growth factor -
DE incorporates useful restriction sites at frequent intervals to
DE facilitate cassette mutagenesis of specified regions.
PS Claim 2; Fig 3a; 12pp; English.
CC The synthetic arGF gene incorporates useful restriction sites at
CC frequent intervals to facilitate the cassette mutagenesis of
CC selected regions. Also included are flanking sites to simplify
CC the incorporation of the gene into any expression system.
CC The arGF mol. acts in a cascade effect to control endothelial cell
CC activity either co-ordinately through synergistic effects or via
CC independent routes. The regulation of endothelial cells is essential
CC for the protection of arteries, veins and capillaries from the effect
CC of thrombogenesis. Their stimulation and control by these factors is
CC also thought to be important in the development of tumours and
CC atherosclerosis.
CC Sequence 151 AA;
SQ
Query Match 70.8%; Score 920; DB 1; Length 151;
Best Local Similarity 93.8%; Pred. No. 6.60e-81;
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;
Db 8 LPPGNWKPKLLXCSNGGHFLRLPDGTVDPGTRDRSDQHILQLLSAESVGEVIKSTETG 67
QY | : ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||
38 LLDANYKKPKLLXCSNGGHFLRLPDGTVDPGTRDRSDQHILQLLSAESVGEVIKSTETG 97
Db 68 QYLAMDVDGLLYGSQTNEECFLERLEE-----NHYNTYISKHAEKNWFVGLKKNGS 121
-QY | ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||
98 QYLAMDVDGLLYGSQTNEECFLERLEEATPAPNHYNTYISKHAEKNWFVGLKKNGS 157
122 CKRGPRTHYGOKAILFLPLPVSSD 145
QY | ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||
158 CKRGPRTHYGOKAILFLPLPVSSD 181
RESULT 9
ID W92283 standard; protein; 154 AA.
AC W92283;
DT 20-APR-1999 (first entry)
DE Human beta-endothelial cell growth factor (ECGF) protein sequence.
KW Endothelial cell growth factor; ECGF; cleavable; recombinant; repair;
KW regenerate; blood vessel; endothelial cell; human.
OS Homo sapiens.
PN US5849538-A.
PD 15-DEC-1998.
PF 11-APR-1997; 840088.
PR 04-NOV-1996; US-743261.
PR 03-MAR-1986; US-835594.
PR 18-DEC-1987; US-134499.
PR 29-APR-1991; US-693079.
PR 27-NOV-1991; US-799859.
PR 03-NOV-1994; US-334884.
PR 07-JUN-1995; US-472964.
PR 11-APR-1997; US-840088.
PA (RHON ) RHONE-POULENC RORER PHARM INC.

```

QY 38 LLDANYKKPKLLYCSNGGHHFLRLPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETG 97  
Db 77 QYLANDTDGLLYGSOTPNEECLFLERLEE-----NHNTYISKHAEKNFVGLKKNKS 130  
QY 98 QYLANDTDGLLYGSOTPNEECLFLERLEEATPAPNHNTYISKHAEKNFVGLKKNKS 157  
Db 131 CKRGPRTHYGOKAILFLPLPVSSD 154  
QY\* 158 CKRGPRTHYGOKAILFLPLPVSSD 181

RESULT 11  
ID W06816 standard; Protein; 154 AA.  
AC W06816;  
DT 17-MAR-1997 (first entry)  
DE Human endothelial cell growth factor-beta.  
KW Endothelial cell growth factor-beta; ECGF-beta.  
OS Homo sapiens.  
PA Burgess W, Drohan WN, Jaye M, Maciag T;  
PI US5571790-A.  
PR 05-NOV-1996;  
PR 03-MAR-1986; 835594.  
PR 18-DEC-1987; US-134499.  
PR 29-APR-1991; US-693079.  
PR 27-NOV-1991; US-799859.  
PR 03-NOV-1994; US-334884.  
PR 07-JUN-1995; US-472964.  
PA (RHON ) RHONE-POULENC RORER PHARM INC.  
PI Burgess W, Drohan WN, Jaye M, Maciag T;  
DR WPI: 96-505421/50.  
DR N-PSDB: T45983.  
PT Recombinant human endothelial cell growth factors - for treating  
PS Claim 1: Column 16: 22pp; English.  
CC Human recombinant endothelial cell growth factors (ECGF) beta  
CC (W06816) and alpha (W06817) differ only at their N-terminal ends.  
CC They can be produced in transformed prokaryotic or eukaryotic host  
CC cells using DNA sequences (T45983 and T45984, respectively) derived  
CC from the complete human ECGF cDNA (T45985). Large quantities of  
CC the ECGFs are produced by culturing the host cells and recovering  
CC the proteins. ECGFs have utility in the growth and amplification  
CC of endothelial cells in culture. They can potentially be used to  
CC treat damaged blood vessels and other endothelial cell-lined  
CC structures, and also have diagnostic applns.  
SQ Sequence 154 AA;

Query Match 70.8%; Score 920; DB 1; Length 154;  
Best Local Similarity 93.8%; Pred. No. 6.60e-81;  
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

QY 17 LPPGNYKKPKLLYCSNGGHHFLRLPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETG 76  
QY 38 LLDANYKKPKLLYCSNGGHHFLRLPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETG 97  
Db 77 QYLANDTDGLLYGSOTPNEECLFLERLEE-----NHNTYISKHAEKNFVGLKKNKS 130  
QY 98 QYLANDTDGLLYGSOTPNEECLFLERLEEATPAPNHNTYISKHAEKNFVGLKKNKS 157  
Db 131 CKRGPRTHYGOKAILFLPLPVSSD 154  
QY 158 CKRGPRTHYGOKAILFLPLPVSSD 181

RESULT 13  
ID P94037 standard; protein; 155 AA.  
AC P94037;  
DT 25-JUN-1990 (first entry)  
DE Human acidic fibroblast growth factor.  
KW Acidic fibroblast growth factor.  
OS Homo sapiens.  
PN EP-298723-A.  
PD 11-JAN-1989.  
PF 06-JUL-1988; 306158.  
PR 07-JUL-1987; US-070797.  
PA (BIOT-) Biotechn Res Assoc.  
PI Fiddes JC, Abraham JA, Protter A;  
DR WPI: 89-009785/02.  
DR N-PSDB: N93088.  
PT Recombinant DNA encoding new fibroblast growth factor  
PT analogues - useful eg for accelerating wound healing and  
PT to control neovascularisation.  
PS Disclosure; p; English.  
CC See also P94038.  
SQ Sequence 155 AA;

Query Match 70.8%; Score 920; DB 1; Length 155;  
Best Local Similarity 93.8%; Pred. No. 6.60e-81;  
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

QY 18 LPPGNYKKPKLLYCSNGGHHFLRLPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETG 77  
QY 38 LLDANYKKPKLLYCSNGGHHFLRLPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETG 97  
Db 78 QYLANDTDGLLYGSOTPNEECLFLERLEE-----NHNTYISKHAEKNFVGLKKNKS 131

PF 04-NOV-1996; 743261.  
PR 04-NOV-1996; US-743261.  
PR 03-MAR-1986; US-835594.  
PR 18-DEC-1987; US-134499.  
PR 29-APR-1991; US-693079.  
PR 27-NOV-1991; US-799859.  
PR 03-NOV-1994; US-334884.  
PR 07-JUN-1995; US-472964.  
PA (RHON ) RHONE-POULENC RORER PHARM INC.  
PI Burgess W, Drohan WN, Jaye M, Maciag T;  
DR WPI: 98-594032/50.  
PT Compositions for promoting wound healing - containing endothelial  
PT cell growth factor polypeptides  
PS Claim 1: Column 16: 23pp; English.  
CC This sequence represents the amino acid sequence of the mature human  
CC beta-endothelial cell growth factor (b-ECGF). This amino acid sequence  
CC is identical to the alpha-ECGF but the beta sequence contains an extra  
CC 20 N-terminal amino acids. The sequence was isolated from a human brain  
CC stem cell cDNA library using a probe designed based on fragments of the  
CC bovine ECGF (see W75416-W75418). The ECGF protein can be used in  
CC compositions for promoting wound healing. ECGF is also used to grow  
CC cells on a prosthetic device.  
SQ Sequence 154 AA;

Query Match 70.8%; Score 920; DB 1; Length 154;  
Best Local Similarity 93.8%; Pred. No. 6.60e-81;  
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db 17 LPPGNYKKPKLLYCSNGGHHFLRLPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETG 76  
QY 38 LLDANYKKPKLLYCSNGGHHFLRLPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETG 97  
Db 77 QYLANDTDGLLYGSOTPNEECLFLERLEE-----NHNTYISKHAEKNFVGLKKNKS 130  
QY 98 QYLANDTDGLLYGSOTPNEECLFLERLEEATPAPNHNTYISKHAEKNFVGLKKNKS 157  
Db 131 CKRGPRTHYGOKAILFLPLPVSSD 154  
QY 158 CKRGPRTHYGOKAILFLPLPVSSD 181

RESULT 13  
ID P94037 standard; protein; 155 AA.  
AC P94037;  
DT 25-JUN-1990 (first entry)  
DE Human acidic fibroblast growth factor.  
KW Acidic fibroblast growth factor.  
OS Homo sapiens.  
PN EP-298723-A.  
PD 11-JAN-1989.  
PF 06-JUL-1988; 306158.  
PR 07-JUL-1987; US-070797.  
PA (BIOT-) Biotechn Res Assoc.  
PI Fiddes JC, Abraham JA, Protter A;  
DR WPI: 89-009785/02.  
DR N-PSDB: N93088.  
PT Recombinant DNA encoding new fibroblast growth factor  
PT analogues - useful eg for accelerating wound healing and  
PT to control neovascularisation.  
PS Disclosure; p; English.  
CC See also P94038.  
SQ Sequence 155 AA;

Query Match 70.8%; Score 920; DB 1; Length 155;  
Best Local Similarity 93.8%; Pred. No. 6.60e-81;  
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db 18 LPPGNYKKPKLLYCSNGGHHFLRLPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETG 77  
QY 38 LLDANYKKPKLLYCSNGGHHFLRLPDGTVDGTRDRSDQHIOQLSAESVGEVYIKSTETG 97  
Db 78 QYLANDTDGLLYGSOTPNEECLFLERLEE-----NHNTYISKHAEKNFVGLKKNKS 131

QY 98 QYLANDTDGLLYGSGTNPNECLFLERLEEAATPAPNHNTYISKHAEKNWFVGLKNGS 157  
Db 132 CKRGPRTHYGQKAILFLPLPVSSD 155  
QY 158 CKRGPRTHYGQKAILFLPLPVSSD 181

## RESULT 14

ID R70812 standard; protein; 155 AA.  
AC R70812;  
DT 01-SEP-1995 (first entry)  
DE FGF-1.  
KW FGF-1; fibroblast growth factor; cytotoxic conjugate; fusion protein;  
KW saporin; cytostatic; tumor; diabetes; rheumatoid arthritis.  
OS Homo sapiens.  
FH Key Location/Qualifiers  
FT misc\_difference 31  
FT /note= "Cys may be replaced by Ser"  
FT misc\_difference 132  
FT /note= "Cys may be replaced by Ser"  
W09503831-A.  
PF 09-FEB-1995.  
PF 27-JUL-1994; U08511.  
PR 02-AUG-1993; US-099924.  
PR 29-OCT-1993; US-145829.  
PA (PRIZ-) PRIZM PHARM INC.  
PA (WHIT-) WHITTIER INST DIABETES & ENDOCRINOLOGY.  
PI Baird AJ, Lappi DA, Sosnowski BA;  
DR WPI; 95-082038/11.  
PT New monogenic preparations of cytotoxic conjugates and DNA -  
PT contain fibroblast growth factors and cytotoxic agents for  
PT treating FGF conditions such as tumours, diabetes and rheumatoid  
PT arthritis.  
PS Disclosure; Page 108-109; 128pp; English.  
CC Novel fusion proteins comprise FGF linked to saporin. FGF-1 to -9  
CC may be used, pref. FGF-1 (R70812), FGF-5 (R70813), FGF-7 (R70814) or  
CC FGF-8 (R70815) muteins, in which at least 1 Cys residue is replaced  
CC by conservative Ser substitutions. The fusion proteins are potent  
CC cytotoxic agents to cells bearing the FGF receptor.  
SQ Sequence 155 AA;

Query Match 70.8%; Score 920; DB 1; Length 155;  
Best Local Similarity 93.8%; Pred. No. 6.60e-81;  
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;  
Db 18 LPPGNYKKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTETG 77  
| :|||||  
38 LLDANYKKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTETG 97  
| :|||||  
78 QYLANDTDGLLYGSGTNPNECLFLERLEE-----NHYNTYISKHAEKNWFVGLKNGS 131  
| :|||||  
QY 98 QYLANDTDGLLYGSGTNPNECLFLERLEEAATPAPNHNTYISKHAEKNWFVGLKNGS 157  
| :|||||  
Db 132 CKRGPRTHYGQKAILFLPLPVSSD 155  
| :|||||  
QY 158 CKRGPRTHYGQKAILFLPLPVSSD 181  
| :|||||

## RESULT 15

ID P70482 standard; protein; 155 AA.  
AC P70482;  
DT 13-MAY-1991 (first entry)  
DE Sequence encoded by complete cDNA sequence of human endothelial  
DE cell growth factor (ECGF).  
KW Endothelial cell regeneration; blood vessel regeneration.  
OS Homo sapiens.  
FH Key Location/Qualifiers  
FT protein 2..15  
FT /label= Beta ECGF  
FT protein 16..21  
FT /label= Acidic FGF  
FT protein 22..155  
FT /label= Alpha ECGF

PN W08705332-A.  
PD 11-SEP-1987.  
PF 02-MAR-1987; U00425.  
PR 03-MAR-1986; US-835594.  
PR 26-MAR-1987; ES-000812.  
PA (MELO-) MELOY LAB INC.  
PA (RORE-) RORER BIOTECHN INC.  
PA (RORE-) RORER.  
PA BIOTECH INC.  
PI Jaye M, Burgess W, Maciag T, Drohan W;  
DR WPI; 87-264128/37.  
DR N-PSDB; N70788  
PT Human endothelial cell growth factor - produced by recombinant  
PT DNA techniques, useful for wound healing  
PS Example; Fig 8; 43pp; English.  
CC To screen the human brain stem cDNA library for clones contg. ECGF  
CC inserts, a specific oligonucleotide was designed. This  
CC oligonucleotide was based upon a partial AA sequence analysis of  
CC the amino terminus of ECGF (see P70480 and P70481). Fig 3c sets  
CC forth for comparison the AA sequence of cyanogen bromide-cleaved  
CC bovine alpha and beta ECGF (P70834). The two clones that were  
CC isolated, ECGF clones 1 and 29, were analysed in further detail. The  
CC nucleotide sequence of these clones and the AA sequence deduced from  
CC the nucleic acid sequence is shown in Fig 8 (see N70788 and P70482).  
SQ Sequence 155 AA;

Query Match 70.8%; Score 920; DB 1; Length 155;  
Best Local Similarity 93.8%; Pred. No. 6.60e-81;  
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;  
Db 18 LPPGNYKKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTETG 77  
| :|||||  
QY 38 LLDANYKKPKLLYCSNGGHFLRILPDGTVDGTRDRSDQHIQLQLSAESVGEVIKSTETG 97  
| :|||||  
Db 78 QYLANDTDGLLYGSGTNPNECLFLERLEE-----NHYNTYISKHAEKNWFVGLKNGS 131  
| :|||||  
QY 98 QYLANDTDGLLYGSGTNPNECLFLERLEEAATPAPNHNTYISKHAEKNWFVGLKNGS 157  
| :|||||  
Db 132 CKRGPRTHYGQKAILFLPLPVSSD 155  
| :|||||  
QY 158 CKRGPRTHYGQKAILFLPLPVSSD 181  
| :|||||

Search completed: Tue Aug 29 15:48:52 2000  
Job time : 24 secs.



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MPsrch\_pp protein - protein database search, using Smith-Waterman algorithm  
 on: Tue Aug 29 15:47:36 2000; MasPar time 11.25 Seconds  
 758.757 Million cell updates/sec  
 Cellular output not generated.

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>US-09-121-017B-5
Title:
Description: (1-181) from US09121017B.ppt
Perfect Score: 1300
Sequence: 1 MSRGAGRGVGTQALVFLGV.....PRTHYGKALFLPLPVSSD 181
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Scoring table: PAM 150  
Gap 11

Searched: 142080 seqs, 47172406 residues

Post-processing: Minimum Match 08  
Listing first 45 summaries

Database: pir64  
1:pir1 2:pir2 3:pir3 4:pir4

**Statistics:** Mean 43.426; Variance 76.019; scale 0.571

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

## SUMMARIES

cult No.	Query Match	Score	Length	DB	ID	Description	Pred. No.
1	920	70.8	155	1	A33665	acidic fibroblast gro	1.49e-18
2	903	69.5	155	1	A60721	acidic fibroblast gro	1.58e-17
3	900	69.2	155	2	D37360	acidic fibroblast gro	8.10e-17
4	900	69.2	155	2	S04147	acidic fibroblast gro	8.10e-17
5	889	68.4	152	2	JK0476	acidic fibroblast gro	3.24e-17
6	851	65.5	155	1	GRBOA	acidic fibroblast gro	3.07e-16
7	850	65.4	155	2	A60130	acidic fibroblast gro	5.29e-16
8	840	64.6	155	2	JW0035	fibroblast growth fac	1.21e-16
9	464	35.7	189	2	A48834	basic fibroblast grow	1.76e-76
10	458	35.2	157	1	GRBOB	basic fibroblast grow	3.99e-75
11	453	34.8	146	1	S00185	basic fibroblast grow	5.35e-74
12	451	34.7	210	2	A32398	basic fibroblast grow	1.51e-73
13	449	34.5	154	2	A31674	basic fibroblast grow	4.26e-73
14	445	34.2	154	2	C37620	basic fibroblast grow	3.39e-72
15	439	33.8	164	2	S31622	basic fibroblast grow	7.56e-71
16	427	32.8	155	1	A40117	basic fibroblast grow	3.72e-68
17	407	31.3	137	2	I46711	fibroblast growth fac	1.09e-63
18	305	23.5	208	2	A48137	fibroblast growth fac	2.39e-41
19	305	23.5	208	2	S66486	fibroblast growth fac	2.39e-41
20	285	21.9	207	2	UC5941	fibroblast growth fac	4.40e-37
21	280	21.5	207	2	JC5940	fibroblast growth fac	5.03e-36
22	275	21.2	208	2	I34192	fibroblast growth fac	5.72e-35
23	267	20.5	160	2	JH0708	fibroblast growth fac	2.75e-33

```

#authors      Chiu, I.M.; Wang, W.P.; Lehtoma, K.
#journal      Oncogene (1990) 5:755-762
#title        Alternative splicing generates two forms of mRNA coding for
               human heparin-binding growth factor 1.
#cross-references MIM:90265618
#accession    A43804
##molecule_type mRNA
##residues    1-155 ##label CHI
##cross-references EMBL:X51943; NID:g32435; PIDN:CAA36206.1; PID:g32436
REFERENCE
#authors      Jaye, M.; Hawk, R.; Burgess, W.; Ricca, G.A.; Chiu, I.M.;
               Ravera, M.W.; O'Brien, S.J.; Modi, W.S.; Maciag, T.;
               Drohan, W.N.
#journal      Science (1986) 233:541-545
#title        Human endothelial cell growth factor: cloning, nucleotide
               sequence, and chromosome localization.
#cross-references MIM:86261805
#accession    A24662
##molecule_type mRNA
##residues    1-155 ##label JAY
##cross-references GB:M13361; NID:g181941; PIDN:AAA79245.1; PID:g181942
REFERENCE
#authors      Yu, Y.L.; Kha, H.; Golden, J.A.; Migchelsen, A.A.J.; Goetzl,
               E.J.; Turck, C.W.
#journal      J. Exp. Med. (1992) 175:1073-1080
#title        An acidic fibroblast growth factor protein generated by
               alternate splicing acts like an antagonist.
#cross-references MIM:92202857
#accession    JH0707
##molecule_type mRNA
##residues    1-155 ##label YUY
##cross-references GB:X65778; NID:g396163; PIDN:CAA46661.1; PID:g396164
REFERENCE
#authors      Payson, R.A.; Canatan, H.; Chotani, M.A.; Wang, W.P.; Harris,
               S.E.; Myers, R.L.; Chiu, I.M.
#journal      Nucleic Acids Res. (1993) 21:489-495
#title        Cloning of two novel forms of human acidic fibroblast growth
               factor (aFGF) mRNA.
#cross-references MIM:93181239
#accession    S35535
##status      translation not shown
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#accession    S35536
##status      translation not shown
##molecule_type mRNA
##residues    1-58 ##label PA2
##cross-references GB:L01487
REFERENCE
#authors      Crumley, G.; Dionne, C.A.; Jaye, M.
#journal      Biochem. Biophys. Res. Commun. (1990) 171:7-13
#title        The gene for human acidic fibroblast growth factor encodes
               two upstream exons alternatively spliced to the first
               coding exon.
#cross-references MIM:90365758
#accession    I39413
##status      translation not shown
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##cross-references GB:M60515; NID:g178226; PIDN:AAA51672.1; PID:g553170;
               GB:M60516; NID:g178233; PID:g553171
REFERENCE
#authors      Harper, J.W.; Strydom, D.J.; Lobb, R.R.
#journal      Biochemistry (1986) 25:4097-4103
#cross-references MIM:86296647
#accession    A23553
##molecule_type protein
##residues    16-155 ##label HAR
REFERENCE
#authors      Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal      Biochem. Biophys. Res. Commun. (1986) 138:611-617
#title        The complete amino acid sequence of human brain-derived

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               acidic fibroblast growth factor.
#cross-references MIM:86295741
#accession    A24820
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REFERENCE
#authors      Gimenez-Gallego, G.; Conn, G.; Hatcher, V.B.; Thomas, K.A.
#journal      Biochem. Biophys. Res. Commun. (1986) 135:541-548
#title        Human brain-derived acidic and basic fibroblast growth
               factors: amino terminal sequences and specific mitogenic
               activities.
#cross-references MIM:86186784
#accession    A24243
##molecule_type protein
##residues    16-47 ##label GI2
##experimental_source brain
REFERENCE
#authors      Gautschi, P.; Frater-Schroder, M.; Bohlen, P.
#journal      FEBS Lett. (1986) 204:203-207
#title        Partial molecular characterization of endothelial cell
               mitogens from human brain: acidic and basic fibroblast
               growth factors.
#cross-references MIM:86275260
#accession    A24301
##molecule_type protein
##residues    16-30, 'X', 32-49 ##label GAU
REFERENCE
#authors      Gautschi-Sova, P.; Muller, T.; Bohlen, P.
#journal      Biochem. Biophys. Res. Commun. (1986) 140:874-880
#title        Amino acid sequence of human acidic fibroblast growth factor.
#cross-references MIM:87048871
#accession    A26386
##molecule_type protein
##residues    16-155 ##label GA2
##experimental_source brain
REFERENCE
#authors      Chavan, A.J.; Haley, B.E.; Volkin, D.B.; Marfia, K.E.;
               Verticelli, A.M.; Bruner, M.W.; Draper, J.P.; Burke, C.J.;
               Middaugh, C.R.
#journal      Biochemistry (1994) 33:7193-7202
#title        Interaction of nucleotides with acidic fibroblast growth
               factor (FGF-1).
#cross-references MIM:94271773
#accession    A53639
##molecule_type protein
##residues    16-30, 'X', 32-38; 73-75, 'X', 77-97, 'X', 99-101; 128-131, 'X',
               133-140, 'X', 142-152 ##label CHA
GENETICS
#gene         GDB:FGF1; FGFA
##cross-references GDB:119909; OMIM:131220
#map_position 5q31.3-5q33.2
#introns      57/1; 91/3
CLASSIFICATION
#superfamily  #superfamily fibroblast growth factor
KEYWORDS
#alternative   alternative splicing; growth factor; heparin binding
FEATURE
#product       product fibroblast growth factor 1 #status experimental
#label         #label MAT\
#binding_site  #binding_site carbohydrate (Asn) (covalent) #status
               absent
SUMMARY
#length        155 #molecular_weight 17460 #checksum 9243
Query Match      70.88; Score 920; DB 1; Length 155;
Best Local Similarity 93.88; Pred. No. 1.49e-182;
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;
Db 18 LPPGNYKKPKLLYCSNGGHFLRLIPDGTGTRDRSDQHIQLQLSAESVGEVIKSTETG 77
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QY 38 LLDANYKKPKLLYCSNGGHFLRLIPDGTGTRDRSDQHIQLQLSAESVGEVIKSTETG 97
| : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
Db 78 QYLAMTDGLLYGSQTPNEECLEFLERLEE-----NHYNTYISKHAENWFVGLKNGS 131
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
QY 98 QYLAMTDGLLYGSQTPNEECLEFLERLEEAAATPAPNHYNTYISKHAENWFVGLKNGS 157

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Db 132 CRGPRTHYGQKAILFLPLPVSSD 155
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Qy 158 CRGPRTHYGQKAILFLPLPVSSD 181

RESULT 2
ENTRY A60721 #type complete
TITLE acidic fibroblast growth factor - golden hamster
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Mesocricetus auratus #common_name golden hamster
DATE 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change
10-Sep-1999
ACCESSIONS A60721
REFERENCE A60721
#authors Hall, J.A.; Harris, M.A.; Malark, M.; Mansson, P.E.; Zhou,
H.; Harris, S.E.
#journal J. Cell. Biochem. (1990) 43:17-26
#title Characterization of the hamster DDT-1 cell aFGF/HBGF-I gene
and cDNA and its modulation by steroids.
#cross-references MUID:90270291
#accession A60721
#status not compared with conceptual translation
#molecule_type DNA
#residues 1-155 #label HAL
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17403 #checksum 9573

Query Match 69.5%; Score 903; DB 1; Length 155;
Best Local Similarity 91.7%; Pred. No. 1.58e-178;
Matches 132; Conservative 2; Mismatches 4; Indels 6; Gaps 1;

Db 18 LPPGNYKPKLLYCSNGGHFLRILPDGTGTRDRSDQHIQLQLSAESAGEVYIKGTETG 77
| - |||||
Qy 38 LLDANYKPKLLYCSNGGHFLRILPDGTGTRDRSDQHIQLQLSAESAGEVYIKSTENG 97
| - |||||

Db 78 QYLANDTDGLLYGSQTPNEECFLERLEE-----NHYNTYTSKKHAEKNWFVGLKKNKS 131
|||||
Qy 98 QYLANDTDGLLYGSQTPNEECFLERLEEATPAPNHNTYTSKKHAEKNWFVGLKKNKS 157
|||||

Db 132 CRGPRTHYGQKAILFLPLPVSSD 155
|||||
Qy 158 CRGPRTHYGQKAILFLPLPVSSD 181
|||||

RESULT 3
ENTRY D37360 #type complete
TITLE acidic fibroblast growth factor - mouse
ALTERNATE_NAMES aFGF; FGF-1
ORGANISM #formal_name Mus musculus #common_name house mouse
DATE 17-Apr-1993 #sequence_revision 17-Apr-1993 #text_change
16-Jul-1999
ACCESSIONS D37360; JC5231
REFERENCE A37360
#authors Hebert, J.M.; Basilico, C.; Goldfarb, M.; Haub, O.; Martin,
G.R.
#journal Dev. Biol. (1990) 138:454-463
#title Isolation of cDNAs encoding four mouse FGF family members and
characterization of their expression patterns during
embryogenesis.
#cross-references MUID:90201563
#accession D37360
#status preliminary
#molecule_type mRNA
#residues 1-155 #label HEB
#cross-references GB:M30641; NID:g193284; PIDN:AAA37618.1; PID:g309236
JC5231
#authors Madai, F.; Hackshaw, K.V.; Chiu, I.M.
#journal Gene (1996) 179:231-236
#title Cloning and characterization of the mouse Fgf-1 gene.
#cross-references MUID:97128312
#accession JC5231
#status preliminary
```

```
##molecule_type DNA
##residues 1-155 #label MAD
##cross-references GB:U36456
COMMENT This protein is an inducer of neovascularization in angiogenic
disease including atherosclerosis, cancer and inflammatory
autoimmune disease.

GENETICS
#gene Fgf-1
#introns 57/1; 91/3
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341

Query Match 69.2%; Score 900; DB 2; Length 155;
Best Local Similarity 92.2%; Pred. No. 8.10e-178;
Matches 130; Conservative 3; Mismatches 2; Indels 6; Gaps 1;

Db 21 GNYKKPKLLYCSNGGHFLRILPDGTGTRDRSDQHIQLQLSAESAGEVYIKGTETGOYL 80
:|||||
Qy 41 ANYKKPKLLYCSNGGHFLRILPDGTGTRDRSDQHIQLQLSAESAGEVYIKSTETGOYL 100
|||||

Db 81 AMDTEGLLYGSQTPNEECFLERLEE-----NHYNTYTSKKHAEKNWFVGLKKNKSGCKR 134
|||||
Qy 101 AMDTDGLLYGSQTPNEECFLERLEEATPAPNHNTYTSKKHAEKNWFVGLKKNKSGCKR 160
|||||

Db 135 GPRTHYGQKAILFLPLPVSSD 155
|||||
Qy 161 GPRTHYGQKAILFLPLPVSSD 181
|||||

RESULT 4
ENTRY S04147 #type complete
TITLE acidic fibroblast growth factor 1 - rat
ALTERNATE_NAMES heparin-binding growth factor 1
ORGANISM #formal_name Rattus norvegicus #common_name Norway rat
DATE 28-Feb-1990 #sequence_revision 28-Feb-1990 #text_change
16-Jul-1999
ACCESSIONS S04147
REFERENCE S04147
#authors Goodrich, S.P.; Yan, G.C.; Bahrenburg, K.; Mansson, P.E.
#journal Nucleic Acids Res. (1989) 17:2867
#title The nucleotide sequence of rat heparin binding growth factor
1 (HBGF-1).
#cross-references MUID:89240051
#accession S04147
##molecule_type mRNA
##residues 1-155 #label GOO
##cross-references EMBL:X14232; NID:g56351; PIDN:CAA32448.1; PID:g56352
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor; heparin binding
SUMMARY #length 155 #molecular-weight 17417 #checksum 9341

Query Match 69.2%; Score 900; DB 2; Length 155;
Best Local Similarity 92.2%; Pred. No. 8.10e-178;
Matches 130; Conservative 3; Mismatches 2; Indels 6; Gaps 1;

Db 21 GNYKKPKLLYCSNGGHFLRILPDGTGTRDRSDQHIQLQLSAESAGEVYIKGTETGOYL 80
:|||||
Qy 41 ANYKKPKLLYCSNGGHFLRILPDGTGTRDRSDQHIQLQLSAESAGEVYIKSTETGOYL 100
|||||

Db 81 AMDTEGLLYGSQTPNEECFLERLEE-----NHYNTYTSKKHAEKNWFVGLKKNKSGCKR 134
|||||
Qy 101 AMDTDGLLYGSQTPNEECFLERLEEATPAPNHNTYTSKKHAEKNWFVGLKKNKSGCKR 160
|||||

Db 135 GPRTHYGQKAILFLPLPVSSD 155
|||||
Qy 161 GPRTHYGQKAILFLPLPVSSD 181
|||||

RESULT 5
ENTRY JH0476 #type fragment
TITLE acidic fibroblast growth factor - pig (fragment)
ORGANISM #formal_name Sus scrofa domestica #common_name domestic pig
DATE 31-Mar-1992 #sequence_revision 31-Mar-1992 #text_change
```

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16-Jul-1999
ACCESSIONS      JH0476; S20072
REFERENCE
#authors      Schmidt, M.; Sharma, H.S.; Schott, R.J.; Schaper, W.
#journal      Biochem. Biophys. Res. Commun. (1991) 180:853-859
#title        Amplification and sequencing of mRNA encoding acidic
#             fibroblast growth factor (aFGF) from porcine heart.
#cross-references MUID:92062117
#accession     JH0476
##molecule_type mRNA
##residues     1-152 #label SCH
##cross-references EMBL:X60317; NID:g1873; PIDN:CAA42869.1; PID:g1874
##experimental_source heart
##note         the hydrophobic core residues are packed around the
                internal symmetry axis
COMMENT        This protein belongs to the fibroblast growth factor family.
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS       growth factor; heparin binding
FEATURE
22-28         #region nuclear location signal\
133           #binding_site heparin (lys) #status predicted
SUMMARY        #length 152 #checksum 1124
Query Match    68.4%; Score 889; DB 2; Length 152;
Best Local Similarity 91.5%; Pred. No. 3.24e-175;
Matches 129; Conservative 2; Mismatches 4; Indels 6; Gaps 1;
Db 18 LPPGNYKKPKLLVCSNGGFLRLPDGTVDGTRDRSDHQLQLSAESVGEVIKSTENG 77
| : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY 38 LLDANYKKPKLLVCSNGGFLRLPDGTVDGTRDRSDHQLQLSAESVGEVIKSTENG 97
| : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
Db 78 QYLAQDTGGLYGSQTPSECLFLERLEE-----NHYNTYTSKKHAENKWFVGLKNGS 131
| : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY 98 QYLAQDTGGLYGSQTPSECLFLERLEEATPAPNHYNTYTSKKHAENKWFVGLKNGS 157
| : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
Db 132 CKRGPRTHYGOKAILFLPLPV 152
| : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY 158 CKRGPRTHYGOKAILFLPLPV 178
| : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :

RESULT 6
ENTRY      GKBOA #type complete
TITLE      acidic fibroblast growth factor precursor - bovine
ALTERNATE_NAMES aFGF; eye-derived growth factor II; heparin-binding growth
                factor I; prostatropin
ORGANISM    #formal_name Bos primigenius taurus #common_name cattle
DATE        13-Aug-1986 #sequence_revision 03-Feb-1994 #text_change
18-Jun-1999
SESSIONS    JH0613; S02102; S02065; B24663; A94281; S03953;
            A91010; A24477; B25043; C25043; A25043; A24539; A60884;
            A37892; B37892; A61198; I46024; A34477; A01385
REFERENCE    JH0613
#authors     Renaud, F.; Desset, S.; Bugra, K.; Halley, C.; Philippe,
#journal      J.M.; Courtois, Y.; Laurent, M.
#title        Biochem. Biophys. Res. Commun. (1992) 184:945-952
                Heterogeneity of 3' untranslated region of bovine acidic FGF
                transcripts.
#cross-references MUID:92246990
#accession     JH0613
##molecule_type DNA
##residues     58-155 #label REN
REFERENCE    S02102
#authors     Halley, C.; Courtois, Y.; Laurent, M.
#journal      Nucleic Acids Res. (1988) 16:10913
#title        Nucleotide sequence of bovine acidic fibroblast growth factor
                cDNA.
#cross-references MUID:89083506
#accession     S02102
##molecule_type mRNA
##residues     1-155 #label HAL
##cross-references EMBL:X13221; NID:g347; PIDN:CAA31610.1; PID:g348
REFERENCE    S02661
#authors     Alterio, J.; Halley, C.; Brou, C.; Soussi, T.; Courtois, Y.;

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Laurent, M.
#journal      FEBS Lett. (1988) 242:41-46
#title        Characterization of a bovine acidic FGF cDNA clone and its
                expression in brain and retina.
#cross-references MUID:89078619
#accession     S02661
##molecule_type mRNA
##residues     1-155 #label ALT
##cross-references EMBL:X14032; NID:g322; PIDN:CAA32192.1; PID:g323
REFERENCE    S22065
#authors     Philippe, J.M.
#journal      submitted to the EMBL Data Library, May 1992
#accession     S22065
##molecule_type mRNA
##residues     1-18 #label PHI
##cross-references EMBL:X66446; NID:g411; PIDN:CAA47063.1; PID:g412
REFERENCE    A94290
#authors     Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman,
                J.; Hjerrild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal      Science (1986) 233:545-548
#title        Nucleotide sequence of a bovine clone encoding the angiogenic
                protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession     B24663
##molecule_type mRNA
##residues     62-102 #label ABR
REFERENCE    A94281
#authors     Gimenez-Gallego, G.; Rodkey, J.; Bennett, C.; Rios-Candelore,
                M.; Disalvo, J.; Thomas, K.
#journal      Science (1985) 230:1385-1388
#title        Brain-derived acidic fibroblast growth factor: complete amino
                acid sequence and homologies.
#cross-references MUID:86070224
#accession     A94281
##molecule_type protein
##residues     16-155 #label GIM
REFERENCE    S03953
#authors     Quinkler, W.; Maasberg, M.; Bernotat-Danielowski, S.; Luethe,
                N.; Sharma, H.S.; Schaper, W.
#journal      Eur. J. Biochem. (1989) 181:67-73
#title        Isolation of heparin-binding growth factors from bovine,
                porcine and canine hearts.
#cross-references MUID:89231704
#accession     S03953
##molecule_type protein
##residues     16-45 #label QUI
REFERENCE    A91010
#authors     Bohlen, P.; Esch, F.; Baird, A.; Gospodarowicz, D.
#journal      EMBO J. (1985) 4:1951-1956
#title        Acidic fibroblast growth factor (FGF) from bovine brain:
                amino-terminal sequence and comparison with basic FGF.
#cross-references MUID:86055750
#accession     A91010
##molecule_type protein
##residues     16-30, 'X', 32-34, 'X', 36-44 #label BOH
REFERENCE    A24477
#authors     Crabb, J.W.; Ames, L.G.; Carr, S.A.; Johnson, C.M.; Roberts,
                G.D.; Bordoli, R.S.; McKeenan, W.L.
#journal      Biochemistry (1986) 25:4988-4993
#title        Complete primary structure of prostatropin, a prostate
                epithelial cell growth factor.
#cross-references MUID:87026586
#accession     A24477
##molecule_type protein
##residues     2, 'GE', 5-155 #label CRA
REFERENCE    A94127
#authors     Burgess, W.H.; Mehman, T.; Marshak, D.R.; Fraser, B.A.;
                Maciag, T.
#journal      Proc. Natl. Acad. Sci. U.S.A. (1986) 83:7216-7220
#title        Structural evidence that endothelial cell growth factor beta
                is the precursor of both endothelial cell growth factor
                alpha and acidic fibroblast growth factor.
#cross-references MUID:87016918

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#accession B25043
#molecule_type protein
#residues 2-155 #label BUR
#note this form was designated beta endothelial cell growth factor

#accession C25043
#molecule_type protein
#residues 16-155 #label BU2
#note this form was designated acidic fibroblast growth factor

#accession A25043
#molecule_type protein
#residues 22-155 #label BU3
#note this form was designated alpha endothelial cell growth factor

REFERENCE
A24539
Strydom, D.J.; Harper, J.W.; Lobb, R.R.
Biochemistry (1986) 25:945-951
Amino acid sequence of bovine brain derived class 1
heparin-binding growth factor.
#cross-references MUID:86187766
#accession A24539
#molecule_type protein
#residues 16-155 #label STR
#note this form was designated brain-derived growth factor A

REFERENCE
A60884
Thomas, K.A.; Gimenez-Gallego, G.; Rios-Candellere, M.;
DiSalvo, J.
J. Protein Chem. (1987) 6:163-171
Primary structure and mitogenic and angiogenic activities of
brain-derived acidic fibroblast growth factor.

#accession A60884
#molecule_type protein
#residues 16-155 #label THO
#note this form was designated brain-derived growth factor A

REFERENCE
A37892
Kuo, M.D.; Huang, S.S.; Huang, J.S.
J. Biol. Chem. (1990) 265:16455-16463
Acidic fibroblast growth factor receptor purified from bovine
liver is a novel protein tyrosine kinase.
#cross-references MUID:90375514
#accession A37892
#molecule_type protein
#residues 22-30, 'X', 32-38 #label KU2
#note this form was designated brain-derived growth factor A

#accession B37892
#molecule_type protein
#residues 62-76, 'X', 78-86 #label KUO
#note this sequence is an amino-terminal fragment of a form
designated as brain-derived growth factor B

REFERENCE
A61198
Hall, C.E.; Belford, D.A.; Godovac-Zimmermann, J.; Hendry,
I.A.
Brain Res. Dev. Brain Res. (1991) 63:13-19
Class 1 heparin binding growth factor promotes the
differentiation but not the survival of ciliary neurones in
vivo.
#cross-references MUID:92164087
#accession A61198
#molecule_type protein
#residues 11-26; 28-50; 53-110, 'H', 112, 'NTY', 134-155 #label HIL
#note this form was designated brain-derived growth factor A

REFERENCE
I46024
Philippe, J.M.; Renaud, F.; Desset, S.; Laurent, M.; Mallet,
J.; Courtois, Y.; Edwards, J.B.
Biochem. Biophys. Res. Commun. (1992) 188:843-850
Cloning of two different 5' untranslated exons of bovine
acidic fibroblast growth factor by the single strand
ligation to single-stranded cDNA methodology.
#cross-references MUID:93075172
#accession I46024
#molecule_type mRNA
#note translated from GB/EMBL/DDBJ

REFERENCE
A34477
Sasaki, H.; Hoshi, H.; Hong, Y.M.; Suzuki, T.; Kato, T.;

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Sasaki, H.; Saito, M.; Youki, H.; Karube, K.; Konno, S.;
Onodera, M.; Saito, T.; Aoyagi, S.
J. Biol. Chem. (1989) 264:17606-17612
Purification of acidic fibroblast growth factor from bovine
heart and its localization in the cardiac myocytes.
#cross-references MUID:90008933
#accession A34477
#status preliminary
#molecule_type protein
#residues 16-24; 121-127; 134-143 #label SAS
#experimental_source heart
COMMENT
The acidic and basic fibroblast growth factors are the major
endothelial-cell growth factors. Both are angiogenic agents in
vivo and are potent mitogens for a variety of mesoderm-derived
cell types in vitro (although bFGF is 30-100 times more potent
than aFGF in stimulating the proliferation of normal diploid
cells). There are differences in the tissue distribution and
concentration of these two growth factors.
COMMENT
This protein binds heparin, although less strongly than does bFGF.
There are some sequence similarities between residues 117-126 (a
region flanked by Lys-Lys dipeptides) and a number of
neuropeptides, including a gastrin-releasing peptide from the pig
...
Note: remainder of annotations omitted.

Query Match 65.5%; Score 851; DB 1; Length 155;
Best Local Similarity 87.9%; Pred. No. 3,07e-166;
Matches 124; Conservative 6; Mismatches 5; Indels 6; Gaps 1;

Db 21 GNYKKPKLLYCSNGGYFLRLPDPDGTGDRSDQHIQQLCAESIGEVYIKSTETGQFL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 41 ANYKKPKLLYCSNGGHFLRLPDPDGTGDRSDQHIQQLCAESVGEVYIKSTETGYL 100
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Db 81 AMDTDGLLYGSQTPNEECFLERLEE-----NHYNYYISKKHAKEKHWFGVGLKNGRSKL 134
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 101 AMDTDGLLYGSQTPNEECFLERLEEATPAPNHYNYYISKKHAKEKHWFGVGLKNGSCKR 160
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Db 135 GPRTHFGOKAILFLPLPVSSD 155
|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
Qy 161 GPRTHFGOKAILFLPLPVSSD 181

RESULT 7
ENTRY #type complete
TITLE A60130 acidic fibroblast growth factor - chicken
ALTERNATE_NAMES endothelial cell growth factor
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE 03-Mar-1993 #sequence_revision 03-Mar-1993 #text_change
16-Jul-1999
ACCESSIONS A60130; S02639
REFERENCE A60130
#authors Schnuerch, H.; Risau, W.
#journal Development (1991) 111:1143-1154
#title Differentiating and mature neurons express the acidic
fibroblast growth factor gene during chick neural
development
#cross-references MUID:91347925
#accession A60130
#status preliminary
#molecule_type mRNA
#residues 1-155 #label SCH
#cross-references GB:S63263; NID:g234372; PIDN:AAB19629.1; PID:g234373

REFERENCE S02639
#authors Risau, W.; Gautschi-Sova, P.; Boehlen, P.
#journal EMBO J. (1988) 7:959-962
#title Endothelial cell growth factors in embryonic and adult chick
brain are related to human acidic fibroblast growth factor.
#cross-references MUID:88296438
#accession S02639
#molecule_type protein
#residues 22-30, 'X', 32-44, 'X', 46-48 #label RIS
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS growth factor

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SUMMARY      #length 155  #molecular-weight 17322  #checksum 7617
Query Match      65.4%; Score 850; DB 2; Length 155;
Best Local Similarity 86.5%; Pred. No. 5.29e-166;
Matches 122; Conservative 6; Mismatches 7; Indels 6; Gaps 1;

Db 21 GNYKKPKLLYCSNGGFLRLPDGKVDGDRSDQHQIQLQLSAEDYGEVYIKSTAGQYL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 41 ANYKKPKLLYCSNGGFLRLPDGTVGDRSDQHQIQLQLSAESYGEVYIKSTEGQYL 100
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 81 AMDTNGLLYGSQTPSECLFLERLEE-----NHYNTYISKHADKNWFVGLKKNKNSKL 134
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 101 AMDTGLLYGSQTPNECLFLERLEEAATPAPNHYNTYISKHAENWFVGLKKNKNSCKR 160
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 135 GPRTHYGOKAILFLPLPVSSD 155
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 161 GPRTHYGOKAILFLPLPVSSD 181
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 8
ENTRY fibroblast growth factor-1 - sheep
TITLE FGF-1
ALTERNATE_NAMES FGF-1
ORGANISM #formal_name Ovis sp. #common_name sheep
DATE 17-Jun-1998 #sequence_revision 10-Jul-1998 #text_change
07-May-1999
ACCESSIONS JW0055
REFERENCE #authors Griebel, T.W.; Ring, M.; Brown, E.; Palmer, C.; Belle, N.;
DonjerKovic, D.; Chang, H.; Yun, J.; Subramanian, R.;
Forozan, F.; Guo, Y.; Vertes, A.; Winkles, J.A.; Burgess,
W.H.
#journal Biochem. Biophys. Res. Commun. (1998) 246:182-191
#title Primary structure of ovine fibroblast growth factor-1 deduced
by protein and cDNA analysis.
#cross-references MUID:98262939
#accession JW0055
#molecule_type mRNA
#residues 1-155 #label GRI
COMMENT This protein is a potent mitogenic factor for NIH 3T3 fibroblasts
in the absence of heparin.
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 155 #molecular-weight 17557 #checksum 8890

Query Match 64.6%; Score 840; DB 2; Length 155;
Best Local Similarity 86.5%; Pred. No. 1.21e-163;
Matches 122; Conservative 8; Mismatches 5; Indels 6; Gaps 1;

Db 21 GNYKKPKLLYCSNGGFLRLPDGKVDGDRSDQHQIQLQLSAEDYGEVYIKSTAGQYL 80
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 41 ANYKKPKLLYCSNGGFLRLPDGTVGDRSDQHQIQLQLSAESYGEVYIKSTEGQYL 100
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 81 AMDTNGLLYGSQTPSECLFLERLEE-----NHYNTYISKHADKNWFVGLKKNKNSKL 134
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 101 AMDTGLLYGSQTPNECLFLERLEEAATPAPNHYNTYISKHAENWFVGLKKNKNSCKR 160
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 135 GPRTHYGOKAILFLPLPVSSD 155
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 161 GPRTHYGOKAILFLPLPVSSD 181
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 9
ENTRY #type complete
TITLE basic fibroblast growth factor - chicken
ORGANISM #formal_name Gallus gallus #common_name chicken
DATE 01-Dec-1993 #sequence_revision 18-Nov-1994 #text_change
16-Jul-1999
ACCESSIONS A48834
REFERENCE #authors Borja, A.Z.; Meijers, C.; Zeller, R.
#journal Dev. Biol. (1993) 157:110-118
#title Expression of alternatively spliced bFGF first coding exons
and antisense mRNAs during chicken embryogenesis.

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#cross-references MUID:93246053
#accession A48834
#status preliminary
#molecule_type nucleic acid
#residues 1-189 #label BOR
#experimental_source embryo
#note NCBI backbone (NCBIN:131000,
NCBIP:131001)
REFERENCE S23636
#authors Mitrani, E.; Gruenbaum, Y.; Shohat, H.; Ziv, T.;
#journal Development (1990) 109:387-393
#title Fibroblast growth factor during mesoderm induction in the
early chick embryo.
#cross-references MUID:90382254
#accession S23636
#status preliminary
#molecule_type DNA
#residues 95-128 #label MIT
#cross-references EMBL:X56804; NID:G62855; PIDN:CAA40139.1; PID:G62856
CLASSIFICATION #superfamily fibroblast growth factor
SUMMARY #length 189 #molecular-weight 20312 #checksum 8538

Query Match 35.7%; Score 464; DB 2; Length 189;
Best Local Similarity 48.4%; Pred. No. 1.76e-76;
Matches 75; Conservative 30; Mismatches 42; Indels 8; Gaps 3;

Db 43 LPALPDGGGGGAFPGHEFKRLYCKNGGFLRLNPGRVGVEKSDPHIKLQQAEE 102
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 26 VPSAGARAGQGLLDANYYKKPKLLYCSNGGFLRLPDGTVGDRSDQHQIQLQSAES 85
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 103 RGWSIKGVSANRFLAMKEDGRLLALKKATECEFFERLE-----S-NNYNTYRSKYS 156
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 86 VGEVYIKSTEGQYLAETDGLLYGSQTPNECLFLERLEEAATPAPNHYNTYISKHA 145
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

Db 157 --WYVALKRTGQYKPGPKTGQKAILFLPMSAKS 189
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:
QY 146 KNWFVGLKKNKSGKRGPRTHYGOKAILFLPLPVSS 180
:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:|||||:

RESULT 10
ENTRY #type fragment
TITLE basic fibroblast growth factor precursor - bovine (fragment)
ALTERNATE_NAMES bFGF; kidney-derived growth factor; prostatin
ORGANISM #formal_name Bos primigenius taurus #common_name cattle
DATE 13-Aug-1986 #sequence_revision 02-Jun-1995 #text_change
10-Sep-1999
ACCESSIONS A24663; A32878; A33784; A61550; A61551; A60310; A61094;
A01386; A60316; A22054; A24819
REFERENCE A94290
#authors Abraham, J.A.; Mergia, A.; Whang, J.L.; Tumolo, A.; Friedman,
J.; Hjertild, K.A.; Gospodarowicz, D.; Fiddes, J.C.
#journal Science (1986) 233:545-548
#title Nucleotide sequence of a bovine clone encoding the angiogenic
protein, basic fibroblast growth factor.
#cross-references MUID:86261806
#accession A24663
#molecule_type mRNA
#residues 3-157 #label ABR
#cross-references GB:M13440; NID:G163049; PIDN:AAA30518.1; PID:G163050
#experimental_source pituitary gland
REFERENCE A90924
#authors Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes,
J.C.
#journal Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668
#title Human basic fibroblast growth factor: nucleotide sequence,
genomic organization, and expression in mammalian cells.
#cross-references MUID:87217066
#accession A32878
#molecule_type mRNA
#residues 3-157 #label AB2
REFERENCE A33784
#authors Milner, P.G.; Li, Y.S.; Hoffman, R.M.; Kodner, C.M.; Siegel,
N.R.; Deuel, T.F.

```

```

#journal Biochem. Biophys. Res. Commun. (1989) 165:1096-1103
#title A novel 17 kD heparin-binding growth factor (HBGF-8) in
        bovine uterus: purification and N-terminal amino acid
        sequence
#cross-references MUID:190121211
#accession A33784
#molecule_type protein
#residues 1-14 #label MIL
#note demonstration of a possible alternative initiator or
        splice junction
REFERENCE
#authors Bertolini, J.; Hearn, M.T.W.
#journal Mol. Cell. Endocrinol. (1987) 51:187-199
#title Isolation, characterization and tissue localisation of an
        N-terminal-truncated variant of fibroblast growth factor.
#cross-references MUID:87247652
#accession A61550
#molecule_type protein
#residues 16-35 #label BER
#note A61551
#authors Ueno, N.; Baird, A.; Esch, F.; Ling, N.; Guillemin, R.
#journal Mol. Cell. Endocrinol. (1987) 49:189-194
#title Isolation and partial characterization of basic fibroblast
        growth factor from bovine testis.
#cross-references MUID:87162856
#accession A61551
#molecule_type protein
#residues 27-35, 'X', 37-41 #label UE3
#experimental_source testes
#note This form appears to be identical to the renal form
#accession A60310
#authors Ueno, N.; Baird, A.; Esch, F.; Shimasaki, S.; Ling, N.;
        Guillemin, R.
#journal Regul. Pept. (1986) 16:135-145
#title Purification and partial characterization of a mitogenic
        factor from bovine liver: structural homology with basic
        fibroblast growth factor.
#cross-references MUID:87119165
#accession A60310
#molecule_type protein
#residues 23-35, 'X', 37-42 #label UEN
#experimental_source liver
#note A24819
#authors Ueno, N.; Baird, A.; Esch, F.; Ling, N.; Guillemin, R.
#journal Biochem. Biophys. Res. Commun. (1986) 138:580-588
#title Isolation of an amino terminal extended form of basic
        fibroblast growth factor.
#cross-references MUID:86295737
#contents annotation
#note the amino end of this form was blocked; the peptide
        composition matched what was thought to be the signal
        sequence
REFERENCE
#authors Gospodarowicz, D.; Baird, A.; Cheng, J.; Lui, G.M.; Esch, F.;
        Bohlen, P.
#journal Endocrinology (1986) 118:82-90
#title Isolation of fibroblast growth factor from bovine adrenal
        gland: physicochemical and biological characterization.
#cross-references MUID:86081530
#accession A61094
#molecule_type protein
#residues 12-25, 27-35, 'X', 37-40 #label GOS
#experimental_source adrenal gland
#note A01386
#authors Esch, F.; Baird, A.; Ling, N.; Ueno, N.; Hill, F.; Denoroy,
        L.; Klepper, R.; Gospodarowicz, D.; Bohlen, P.; Guillemin,
        R.
#journal Proc. Natl. Acad. Sci. U.S.A. (1985) 82:6507-6511
#title Primary structure of bovine pituitary basic fibroblast growth
        factor (FGF) and comparison with the amino-terminal
        sequence of bovine brain acidic FGF.
#cross-references MUID:86016731
#accession A01386

```

```

#molecule_type protein
#residues 12-157 #label ESC
#experimental_source pituitary gland
#note A60316
REFERENCE
#authors Baird, A.; Esch, F.; Bohlen, P.; Ling, N.; Gospodarowicz, D.
#journal Regul. Pept. (1985) 12:201-213
#title Isolation and partial characterization of an endothelial cell
        growth factor from the bovine kidney: homology with basic
        fibroblast growth factor.
#cross-references MUID:86093426
#accession A60316
#molecule_type protein
#residues 27-35, 'X', 37-43 #label BAI
#experimental_source kidney
#note A22054
REFERENCE
#authors Bohlen, P.; Baird, A.; Esch, F.; Ling, N.; Gospodarowicz, D.
#journal Proc. Natl. Acad. Sci. U.S.A. (1984) 81:5364-5368
#title Isolation and partial molecular characterization of pituitary
        fibroblast growth factor.
#cross-references MUID:84298139
#accession A22054
#molecule_type protein
#residues 12-26 #label BOH
#note The acidic and basic fibroblast growth factors are the major
        endothelial-cell growth factors. Both are angiogenic agents in
        vivo and are potent mitogens for a variety of mesoderm-derived
        cell types in vitro (although bFGF is 30-100 times more potent
        than aFGF in stimulating the proliferation of normal diploid
        cells).
#comment This protein binds heparin more strongly than does aFGF.
#classification #superfamily fibroblast growth factor
#keywords alternative splicing; angiogenesis; growth factor; heparin
        binding; mitogen
FEATURE
1-157 #product basic fibroblast growth factor, uterine form
#status predicted #label MAT1\
4-157 #product basic fibroblast growth factor, pituitary gamma
        form #status experimental #label MAT2\
12-157 #product basic fibroblast growth factor, pituitary alpha
        form #status experimental #label MAT3\
16-157 #product basic fibroblast growth factor, pituitary short
        form #status predicted #label MAT4\
23-157 #product basic fibroblast growth factor, hepatic form
        #status experimental #label MAT5\
27-157 #product basic fibroblast growth factor, renal form
        #status experimental #label MAT6\
29-33, 118-121 #region heparin binding #status predicted\
4 #modified site blocked amino end (Ala) (in mature form
        pituitary gamma) (probably acetylated) #status
        experimental
SUMMARY
#length 157 #checksum 1115
Query Match 35.2% Score 458; DB 1; Length 157;
Best Local Similarity 49.0%; Pred. No. 3,99e-75;
Matches 76; Conservative 29; Mismatches 42; Indels 8; Gaps 3;
Db 11 LPALPEDGSGAPPCHPKDKPKLYCKNGGFLRHPDGRVDGVRKSDPHKLGQJAE 70
   ::::: ::::: ::::: ::::: ::::: ::::: ::::: ::::: :::::
QY 26 VPSAGARAAQTLTDANKPKPKLYCSNGHFLRLPDGTVDTGDRSDQHILQJSAES 85
   ::::: ::::: ::::: ::::: ::::: ::::: ::::: :::::
Db 71 RGWSIKGVCANRYLAMKEDGRLLASKCVTDRCFFERLE-----S-NNYNTRYSRKYS- 123
   ::::: ::::: ::::: ::::: ::::: ::::: ::::: :::::
QY 86 VGEVIKSTETGYLAMDTDGLLYGSQTPNECLFLELEENATPAPNHYNTYLLKKHAE 145
   ::::: ::::: ::::: ::::: ::::: ::::: ::::: :::::
Db 124 -SWYVALRRTGYKLGPKTGPQKAILFLPMSAKS 157
   ::::: ::::: ::::: ::::: ::::: ::::: ::::: :::::
QY 146 KNWFGVLKNGSKRGPRTHYQRAILFLPLPVSS 180
   ::::: ::::: ::::: ::::: ::::: ::::: ::::: :::::
RESULT 11
ENTRY #type complete
TITLE basic fibroblast growth factor - sheep
ALTERNATE_NAMES prostatin

```

```

ORGANISM      #formal_name Ovis orientalis aries, Ovis ammon aries
               #common_name domestic sheep
DATE          10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change
               10-Sep-1999
ACCESSIONS    S00185
REFERENCE      #authors Simpson, R.J.; Moritz, R.L.; Lloyd, C.J.; Fabril, L.J.; Nice,
               E.C.; Rubira, M.R.; Burgess, A.W.
#journal      FEBS Lett. (1987) 224:128-132
#title        Primary structure of ovine pituitary basic fibroblast growth
               factor.
#cross-references MUID:88055577
#accession    S00185
#molecule_type protein
#residues     1-146 #label SIM
CLASSIFICATION #superfamily fibroblast growth factor
KEYWORDS       growth factor; heparin binding; mitogen
FEATURE        18-22 #region heparin binding #status predicted\
107-110        #region heparin binding #status predicted
MWARY         #length 146 #molecular-weight 16434 #checksum 3560

Query Match 34.8%; Score 453; DB 1; Length 146;
Best Local Similarity 52.9%; Pred. NO. 5.35e-74;
Matches 74; Conservative 23; Mismatches 35; Indels 8; Gaps 3;

Db 15 GHFKDKRLCKNGGFLRLHPDGRVDGVRKSDPHKQLQLOAERGWSIKGVCANRYL 74
   : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY 41 ANYKKPLLYCSNGGFLRLPDGTVDGTRSDQHLQLSAEGVGVYIKSTETGOYL 100
   : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
Db 75 AMKEDGRLLASKVTDCEFFERLE-----S-NNYNYRGRKYS--SWYVALKRTGOYKL 126
   : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY 101 AMDTDGLLYGSQTNECLFLERLEEARATPAPNHYNYISKHAEKNWVGLKNGSCKR 160
   : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
Db 127 GPKTGPQOKAFLPLPMSAKS 146
   : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
QY 161 GPRTHYGOKAFLPLPVS 180

RESULT 12
ENTRY      A32398 #type complete
TITLE      basic fibroblast growth factor precursor, 22.5K form - human
ALTERNATE_NAMES bfGF; fibroblast growth factor 2; prostatic growth factor;
               prostatin
CONTAINS    basic fibroblast growth factor, 18K form
ORGANISM    #formal_name Homo sapiens #common_name man
DATE        31-Jul-1989 #sequence_revision 31-Dec-1993 #text_change
               16-Jul-1999
#cross-references MUID:89184522
#accession    A32398
#residues     1-210 #label PRA
REFERENCE    #cross-references GB:J04513; NID:g183083; PIDN:AAA52531.1; PID:g459811
#journal      A61537
#authors      Shibata, F.; Baird, A.; Florkiewicz, R. Z.
#title        Growth Factors (1991) 4:277-287
               Functional characterization of the human basic fibroblast
               growth factor gene promoter.
#cross-references MUID:92110035
#accession    A61537
#molecule_type DNA
#residues     1-114 #label SH1
#note         authors translated the codon GGA for residue 47 as Ala

```

```

REFERENCE      A26642
#authors      Kurokawa, T.; Sasada, R.; Ivane, M.; Igarashi, K.
#journal      FEBS Lett. (1987) 213:189-194
#title        Cloning and expression of cDNA encoding human basic
               fibroblast growth factor.
#cross-references MUID:87162468
#accession    A26642
#molecule_type mRNA
#residues     56-210 #label KUR
#cross-references GB:M27968; NID:g182562; PIDN:AAA52448.1; PID:g182563
REFERENCE      A30924
#authors      Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Fiddes,
               J.C.
#journal      Cold Spring Harb. Symp. Quant. Biol. (1986) 51:657-668
#title        Human basic fibroblast growth factor: nucleotide sequence,
               genomic organization, and expression in mammalian cells.
#cross-references MUID:87217066
#accession    B32878
#molecule_type mRNA
#residues     56-210 #label ABR
#note         the authors translated the codon GAA for residue 108 as
               Gly
REFERENCE      S00297
#authors      Abraham, J.A.; Whang, J.L.; Tumolo, A.; Mergia, A.; Friedman,
               J.; Gospodarowicz, D.; Fiddes, J.C.
#journal      EMBO J. (1986) 5:2523-2528
#title        Human basic fibroblast growth factor: nucleotide sequence and
               genomic organization.
#cross-references MUID:87053817
#accession    S00297
#status       not compared with conceptual translation
#molecule_type DNA
#residues     1-155 #label AB2
#note         the authors translated the codon GAA for residue 108 as
               Gly
REFERENCE      A54316
#authors      Shimoyama, Y.; Gotoh, M.; Ino, Y.; Sakamoto, M.; Kato, K.;
               Hirohashi, S.
#journal      Jpn. J. Cancer Res. (1991) 82:1263-1270
#title        Characterization of high-molecular-mass forms of basic
               fibroblast growth factor produced by hepatocellular
               carcinoma cells: possible involvement of basic fibroblast
               growth factor in hepatocarcinogenesis.
#cross-references MUID:92091228
#accession    A54316
#molecule_type protein
#residues     'XX', 86-88, 'X', 90-91, 'X', 93-95 #label SH3
#experimental_source C-Li21 hepatocellular carcinoma cell line
#note         sequence extracted from NCBI backbone (NCBIP:71595)
#accession    B54316
#molecule_type protein
#residues     'XXX', 19, 'X', 21-29 #label SH2
#note         sequence extracted from NCBI backbone (NCBIP:71594)
REFERENCE      A33624
#authors      Feige, J.J.; Bradley, J.D.; Fryburg, K.; Farris, J.; Cousens,
               L.C.; Barr, P.J.; Baird, A.
#journal      J. Cell Biol. (1989) 109:3105-3114
#title        Differential effects of heparin, fibronectin, and laminin on
               the phosphorylation of basic fibroblast growth factor by
               protein kinase C and the catalytic subunit of protein
               kinase A.
#cross-references MUID:90078343
#accession    A33624
#status       preliminary
#molecule_type protein
#residues     57-210 #label FEI
REFERENCE      A25824
#authors      Story, M.T.; Esch, F.; Shimasaki, S.; Sasse, J.; Jacobs,
               S.C.; Lawson, R.K.
#journal      Biochem. Biophys. Res. Commun. (1987) 142:702-709
#title        Amino-terminal sequence of a large form of basic fibroblast
               growth factor isolated from human benign prostatic
               hyperplastic tissue.

```





	RESULT	15	
	ENTRY		
	S31622	#type fragment	

\*\*\*\*\*  
[W][A][T][E][R][M][A][N]  
[P][R][O][T][E][I][N]  
[S][E][Q][U][E][N][C][E]  
[T][M]  
\*\*\*\*\*

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MPsrch\_pp protein - protein database search, using Smith-Waterman algorithm  
on: Tue Aug 29 15:45:20 2000; MasPar time 7.94 Seconds  
706.264 Million cell updates/sec  
Regular output not generated.

Title: >US-09-121-017B-5  
Description: (1-181) from US09121017B.pep  
Perfect Score: 1300  
Sequence: 1 MSGAGRVQCTLQALVFLGV.....PRTHYGKAILFLPLPVSSD 181

Scoring table: PAM 150  
Gap 11

Searched: 85661 seqs, 30989116 residues

Post-processing: Minimum Match 0%  
Listing first 45 summaries

Database: swiss-prot38-----  
-I:Swissprot

Statistics: Mean 44.306; Variance 68.544; scale 0.646

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query		ID	Description	Pred. No.	
		Match	Length				
1	920	70.8	155	1	FGF1_HUMAN	HEPARIN-BINDING GROWTH	2.55e-206
2	903	69.5	155	1	FGF1_MESAU	HEPARIN-BINDING GROWTH	9.03e-202
3	900	69.2	155	1	FGF1_MOUSE	HEPARIN-BINDING GROWTH	5.73e-201
4	889	68.4	152	1	FGF1_PIG	HEPARIN-BINDING GROWTH	5.00e-198
5	851	65.5	155	1	FGF1_BOVIN	HEPARIN-BINDING GROWTH	6.96e-188
6	850	65.4	155	1	FGF1_CHICK	HEPARIN-BINDING GROWTH	1.29e-187
7	464	35.7	158	1	FGF2_CHICK	HEPARIN-BINDING GROWTH	1.67e-86
8	458	35.2	155	1	FGF2_BOVIN	HEPARIN-BINDING GROWTH	5.62e-85
9	453	34.8	155	1	FGF2_SHEEP	HEPARIN-BINDING GROWTH	1.05e-83
10	451	34.7	155	1	FGF2_HUMAN	HEPARIN-BINDING GROWTH	3.40e-83
11	449	34.5	154	1	FGF2_RAT	HEPARIN-BINDING GROWTH	1.09e-82
12	445	34.2	154	1	FGF2_MOUSE	HEPARIN-BINDING GROWTH	1.14e-81
13	439	33.8	156	1	FGF2_MONDO	HEPARIN-BINDING GROWTH	3.78e-80
14	427	32.8	155	1	FGF2_XENLA	HEPARIN-BINDING GROWTH	4.12e-77
15	407	31.3	137	1	FGF2_RABIT	HEPARIN-BINDING GROWTH	4.52e-72
16	315	24.2	209	1	FGF9_XENLA	GLIA-ACTIVATING FACTOR	2.64e-49
17	305	23.5	208	1	FGF9_RAT	GLIA-ACTIVATING FACTOR	6.97e-47
18	305	23.5	208	1	FGF9_HUMAN	GLIA-ACTIVATING FACTOR	6.97e-47
19	305	23.5	208	1	FGF9_MOUSE	GLIA-ACTIVATING FACTOR	6.97e-47
20	285	21.9	207	1	FGF6_HUMAN	FIBROBLAST GROWTH FACT	4.45e-42
21	280	21.5	207	1	FGF6_RAT	FIBROBLAST GROWTH FACT	6.94e-41
22	275	21.2	208	1	FGF6_MOUSE	FIBROBLAST GROWTH FACT	1.07e-39
23	262	20.2	220	1	FGF3_CHICK	FIBROBLAST GROWTH FACT	1.26e-36

24	248	19.1	237	1	FGF3_XENLA	FIBROBLAST GROWTH FACT	2.39e-33
25	243	18.7	194	1	FGF7_SHEEP	KERATINOCYTE GROWTH FA	3.46e-32
26	243	18.7	208	1	FGF6_HUMAN	FIBROBLAST GROWTH FACT	3.46e-32
27	242	18.6	208	1	FGFA_HUMAN	FIBROBLAST GROWTH FACT	5.89e-32
28	242	18.6	215	1	FGFA_RAT	FIBROBLAST GROWTH FACT	5.89e-32
29	240	18.5	194	1	FGF7_HUMAN	KERATINOCYTE GROWTH FA	1.71e-31
30	241	18.5	225	1	FGF3_HUMAN	FIBROBLAST GROWTH FACT	1.00e-31
31	240	18.5	239	1	FGF3_HUMAN	INT-2 PROTO-ONCOGENE P	1.71e-31
32	240	18.5	247	1	FGFE_MOUSE	FIBROBLAST GROWTH FACT	1.71e-31
33	239	18.4	247	1	FGFE_HUMAN	FIBROBLAST GROWTH FACT	2.91e-31
34	239	18.4	264	1	FGF5_MOUSE	FIBROBLAST GROWTH FACT	2.91e-31
35	239	18.4	266	1	FGF5_RAT	FIBROBLAST GROWTH FACT	2.91e-31
36	238	18.3	187	1	FGFA_XENLA	FIBROBLAST GROWTH FACT	4.95e-31
37	238	18.3	245	1	FGF3_MOUSE	INT-2 PROTO-ONCOGENE P	4.95e-31
38	236	18.2	194	1	FGF7_MOUSE	KERATINOCYTE GROWTH FA	1.43e-30
39	235	18.1	209	1	FGFA_MOUSE	FIBROBLAST GROWTH FACT	2.43e-30
40	235	18.1	225	1	FGFB_MOUSE	FIBROBLAST GROWTH FACT	2.43e-30
41	234	18.0	268	1	FGF5_HUMAN	FIBROBLAST GROWTH FACT	4.13e-30
42	226	17.4	243	1	FGFC_HUMAN	FIBROBLAST GROWTH FACT	2.80e-28
43	225	17.3	192	1	FGFB_XENLA	FIBROBLAST GROWTH FACT	4.73e-28
44	225	17.3	206	1	FGF4_BOVIN	FIBROBLAST GROWTH FACT	4.73e-28
45	224	17.2	194	1	FGF4_CHICK	FIBROBLAST GROWTH FACT	7.99e-28

ALIGNMENTS

RESULT 1	FGF1_HUMAN	STANDARD;	PRT; 155 AA.
AC	P05230; P07502;		
DT	13-AUG-1987 (Rel. 05, Created)		
DT	13-AUG-1987 (Rel. 05, Last sequence update)		
DT	15-JUL-1999 (Rel. 38, Last annotation update)		
DE	HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST-GROWTH FACTOR) (AFGF) (BETA-ENDOTHELIAL CELL GROWTH FACTOR) (ECGF-BETA).		
GN	FGF1 OR FGFA.		
OS	Homo sapiens (Human).		
OC	Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;		
OC	Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.		
RN	[1]		
RP	SEQUENCE FROM N.A.		
RX	MEDLINE; 86261805.		
RA	Jaye M., Howk R., Burgess W., Ricca G.A., Chiu I.-M., Raverz M.W., O'Brien S.J., Modi W.S., Maciag T., Drohan W.N.;		
RT	"Human endothelial cell growth factor: cloning, nucleotide sequence, and chromosome localization."		
RL	Science 233:541-545(1986).		
RN	[2]		
RP	SEQUENCE FROM N.A.		
RC	TISSUE-BRAIN STEM;		
RX	MEDLINE; 89343957.		
RA	Wang W.P., Lehtoma K., Varban M.L., Krishnan L., Chiu I.M.;		
RT	"Cloning of the gene coding for human class I heparin-binding growth factor and its expression in fetal tissues."		
RL	Mol. Cell. Biol. 9:2387-2395(1989).		
RN	[3]		
RP	SEQUENCE FROM N.A.		
RC	TISSUE-BRAIN STEM;		
RX	MEDLINE; 90265618.		
RA	Chiu I.M., Wang W.P., Lehtoma K.;		
RT	"Alternative splicing generates two forms of mRNA codin; for human heparin-binding growth factor 1."		
RL	Oncogene 5:755-762(1990).		
RN	[4]		
RP	SEQUENCE FROM N.A.		
RX	MEDLINE; 90073637.		
RA	Mergia A., Tischer E., Graves D., Tumolo A., Miller J., Gospodarowicz D., Abraham J.A., Shipley G.D., Fiddes I.C.;		
RT	"Structural analysis of the gene for human acidic fibroblast growth factor."		
RL	Biochem. Biophys. Res. Commun. 164:1121-1129(1989).		
RN	[5]		
RP	SEQUENCE FROM N.A.		

RX MEDLINE; 92019819.  
 RA Wang W.P., Quick D., Balcerzak S.P., Needleman S.W., Chiu I.M.;  
 RT "Cloning and sequence analysis of the human acidic fibroblast growth  
 RL factor gene and its preservation in leukemia patients.";  
 RN Oncogene 6:1521-1529(1991).  
 [6]  
 RX SEQUENCE FROM N.A.  
 RP MEDLINE; 92202857.  
 RA Li Y.L., Kha H., Golden J.A., Migchelsen A.A.J., Goetzl E.J.,  
 RA Turck E.J.;  
 RT "An acidic fibroblast growth factor protein generated by alternate  
 RT splicing acts like an antagonist.";  
 RL J. Exp. Med. 175:1073-1080(1992).  
 [7]  
 RX SEQUENCE OF 1-154 FROM N.A.  
 RP MEDLINE; 94069734.  
 RA Zhao X.M., Yeoh T.K., Hiebert M., Frist W.H., Miller G.G.;  
 RT "The expression of acidic fibroblast growth factor (heparin-binding  
 RT growth factor-1) and cytokine genes in human cardiac allografts and T  
 RT cells.";  
 RL Transplantation 56:1177-1182(1993).  
 [8]  
 RX SEQUENCE OF 1-40 FROM N.A.  
 RP MEDLINE; 90365758.  
 RA Crumley G., Dionne C.A., Jaye M.;  
 RT "The gene for human acidic fibroblast growth factor encodes two  
 RT upstream exons alternatively spliced to the first coding exon.";  
 RL Biochem. Biophys. Res. Commun. 171:7-13(1990).  
 [9]  
 RX SEQUENCE OF 16-155.  
 RP MEDLINE; 86296647.  
 RA Harper J.W., Strydom D.J., Lobb R.R.;  
 RT "Human class I heparin-binding growth factor: structure and homology  
 RT to bovine acidic brain fibroblast growth factor.";  
 RL Biochemistry 25:4097-4103(1986).  
 [10]  
 RX SEQUENCE OF 16-155.  
 RP MEDLINE; 86295741.  
 RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;  
 RT "The complete amino acid sequence of human brain-derived acidic  
 RT fibroblast growth factor.";  
 RL Biochem. Biophys. Res. Commun. 138:611-617(1986).  
 [11]  
 RX SEQUENCE OF 16-155.  
 RP MEDLINE; 87048871.  
 RA Gautschi-Sova P., Mueller T., Boehlen P.;  
 RT "Amino acid sequence of human acidic fibroblast growth factor.";  
 RL Biochem. Biophys. Res. Commun. 140:874-880(1986).  
 [12]  
 RX SEQUENCE OF 16-47.  
 RP MEDLINE; 86186784.  
 RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;  
 RT "Human brain-derived acidic and basic fibroblast growth factors:  
 RT amino terminal sequences and specific mitogenic activities.";  
 RL Biochem. Biophys. Res. Commun. 135:541-548(1986).  
 [13]  
 RX SEQUENCE OF 16-49.  
 RP MEDLINE; 86275260.  
 RA Gautschi P., Frater-Schroeder M., Boehlen P.;  
 RT "Partial molecular characterization of endothelial cell mitogens from  
 RT human brain: acidic and basic fibroblast growth factors.";  
 RL FEBS Lett. 204:203-207(1986).  
 [14]  
 RX X-RAY CRYSTALLOGRAPHY (2.0 ANGSTROMS).  
 RP MEDLINE; 96194129.  
 RA Blaber M., Disalvo J., Thomas K.A.;  
 RT "X-ray crystal structure of human acidic fibroblast growth factor.";  
 RL Biochemistry 35:2086-2094(1996).  
 [15]  
 RX STRUCTURE BY NMR OF 24-155.  
 RP MEDLINE; 94358885.  
 RA Pineda-Lucena A., Jimenez M.A., Nieto J.L., Santoro J., Rico M.,  
 RA Gimenez-Gallego G.;

RT "1H-NMR assignment and solution structure of human acidic fibroblast  
 RT growth factor activated by inositol hexasulfate.";  
 RL J. Mol. Biol. 242:81-98(1994).  
 [16]  
 RX STRUCTURE BY NMR OF 24-155.  
 RP MEDLINE; 97107535.  
 RA Pineda-Lucena A., Jimenez M.A., Lozano R.M., Nieto J.L., Santoro J.,  
 RA Rico M., Gimenez-Gallego G.;  
 RT "Three-dimensional structure of acidic fibroblast growth factor in  
 RT solution: effects of binding to a heparin functional analog.";  
 RL J. Mol. Biol. 264:162-178(1996).  
 [17]  
 RX STRUCTURE BY NMR OF 25-155.  
 RP MEDLINE; 98387896.  
 RA Lozano R.M., Jimenez M., Santoro J., Rico M., Gimenez-Gallego G.;  
 RT "Solution structure of acidic fibroblast growth factor bound to 1,3,  
 RT 6-naphthalenesulfonate: a minimal model for the anti-tumoral  
 RT action of suramin and suradistas.";  
 RL J. Mol. Biol. 281:899-915(1998).  
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
 CC -!- SUBUNIT: MONOMER.  
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY  
 CC THAN DOES BFGF.  
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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 CC -----  
 DR EMBL; M1361; AAA79245.1;  
 DR EMBL; X51943; CAA36206.1;  
 DR EMBL; M30492; AAA52446.1;  
 DR EMBL; M30490; AAA52446.1; JOINED.  
 DR EMBL; M30491; AAA52446.1; JOINED.  
 DR EMBL; M60515; AAA51672.1;  
 DR EMBL; M60516; AAA51673.1;  
 DR EMBL; M23087; AAA52638.1;  
 DR EMBL; M23086; AAA52638.1; JOINED.  
 DR EMBL; S67291; AAB29057.1;  
 DR EMBL; X65778; CAA46661.1;  
 DR PIR; A23553; A23553.  
 DR PIR; A24243; A24243.  
 DR PIR; A24301; A24301.  
 DR PIR; A24662; A24662.  
 DR PIR; A24820; A24820.  
 DR PIR; A26386; A26386.  
 DR PIR; A33665; A33665.  
 DR PIR; S18217; S18217.  
 DR PDB; 2AFG; 15-OCT-95.  
 DR PDB; 1AXM; 22-APR-98.  
 DR PDB; 2AXM; 22-APR-98.  
 DR PDB; 1RML; 11-NOV-98.  
 DR MIM; 131220;  
 DR PFAM; PF00167; FGF; 1.  
 DR PRINTS; PR00262; IL1HBBG.  
 DR PRINTS; PR00263; HBGF.  
 DR PROSITE; PS00247; HBGF\_FGF; 1.  
 KW Growth factor; Mitogen; Vascularization; Heparin-binding; Acetylation;  
 KW 3D-structure.  
 FT PROPEP 1 15  
 FT CHAIN 16 155 HEPARIN-BINDING GROWTH FACTOR 1.  
 FT MOD\_RES 2 2 ACETYLATION  
 FT BINDING 24 28 HEPARIN (POTENTIAL).  
 FT BINDING 113 116 HEPARIN (POTENTIAL).  
 FT SEQUENCE 155-AA; 17460 MW; F586E8BFB09F1580 CRC64;  
 SQ

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Query Match      70.8%; Score 920; DB 1; Length 155;
Best Local Similarity 93.8%; Pred. No. 2.55e-206;
Matches 135; Conservative 1; Mismatches 2; Indels 6; Gaps 1;

Db 18 LPPGNKKPKLYCSNGHFLRILPDGTVDRSDQHIOQLSAESVGEVYIKSTGTG 77
QY 38 LDANKPKPKLYCSNGHFLRILPDGTVDRSDQHIOQLSAESVGEVYIKSTGTG 97
Db 78 QYLANDTDGLLYGSGTNPNEECFLERLEP-----NHYNTYISKHAENKFWVGLKKNKS 131
QY 98 QYLANDTDGLLYGSGTNPNEECFLERLEPAAATPAPNHYNTYISKHAENKFWVGLKKNKS 157
Db 132 CKRGPRTHYGKAILFLPLPVSSD 155
QY 158 CKRGPRTHYGKAILFLPLPVSSD 181

RESULT 2
ID FGFL_MESAU STANDARD; PRT; 155 AA.
AC P34004;
DT 01-FEB-1994 (Rel. 28, Created)
DT 01-FEB-1994 (Rel. 28, Last sequence update)
DT 15-JUL-1999 (Rel. 38, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST
DE GROWTH FACTOR) (AFGF).
DE GROWTH FACTOR) (AFGF).
GN FGFL OR FGF-1.
OS Mesocricetus auratus (Golden hamster).
OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Cricetinae;
OC Mesocricetus.
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE; 90270291.
RA Hall J.A., Harris M.A., Malark M., Mansson P.E., Zhou H., Harris S.E.;
RT "Characterization of the hamster DDT-1 cell aFGF/HBGF-1 gene and cDNA
RT and its modulation by steroids.";
RL J. Cell. Biochem. 43:17-26(1990).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY
CC THAN DOES BFGF.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
DR PIR; A60721; A60721.
DR HSSP; P05230; 2AXM.
DR PFAM; PF00167; FGF; 1.
DR PROSITE; PS00247; HBGF_FGF; 1.
KW Growth factor; Mitogen; Vascularization; Heparin-binding.
FT PROPEP 1 15
FT CHAIN 16 155
FT BINDING 24 28 HEPARIN-BINDING GROWTH FACTOR 1.
FT BINDING 113 116 HEPARIN (POTENTIAL).
SQ SEQUENCE 155 AA; 17403 MW; 41E5EC760E412CC5 CRC64;

Query Match      69.5%; Score 903; DB 1; Length 155;
Best Local Similarity 91.7%; Pred. No. 9.03e-202;
Matches 132; Conservative 2; Mismatches 4; Indels 6; Gaps 1;

Db 18 LPPGNKKPKLYCSNGHFLRILPDGTVDRSDQHIOQLSAESVGEVYIKSTGTG 77
QY 38 LDANKPKPKLYCSNGHFLRILPDGTVDRSDQHIOQLSAESVGEVYIKSTGTG 97
Db 78 QYLANDTDGLLYGSGTNPNEECFLERLEP-----NHYNTYISKHAENKFWVGLKKNKS 131
QY 98 QYLANDTDGLLYGSGTNPNEECFLERLEPAAATPAPNHYNTYISKHAENKFWVGLKKNKS 157
Db 132 CKRGPRTHYGKAILFLPLPVSSD 155
QY 158 CKRGPRTHYGKAILFLPLPVSSD 181

RESULT 3
ID FGFL_MOUSE STANDARD; PRT; 155 AA.
AC P10935;
DT 01-JUL-1989 (Rel. 11, Created)
DT 01-JUL-1989 (Rel. 11, Last sequence update)
DT 15-JUL-1999 (Rel. 38, Last annotation update)
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST
DE GROWTH FACTOR) (AFGF).
DE GROWTH FACTOR) (AFGF).
GN FGFL OR FGF-1 OR FGFA.
OS Mus musculus (Mouse); and Rattus norvegicus (Rat).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
RN [1]
RP SEQUENCE FROM N.A.
RX SPECIES-RAT;
RX MEDLINE; 89240051.
RA Goodrich S., Yan G.C., Bahrenburg K., Mansson P.E.;
RT "The nucleotide sequence of rat heparin binding growth factor 1
RT (HBGF-1).";
RL Nucleic Acids Res. 17:2867-2867(1989).
RN [2]
RP SEQUENCE FROM N.A.
RX SPECIES-MOUSE;
RX MEDLINE; 90201563.
RA Hebert J.M., Basilico C., Goldfarb M., Haub O., Martin G.R.;
RT "Isolation of cDNAs encoding four mouse FGF family members and
RT characterization of their expression patterns during embryogenesis.";
RL Dev. Biol. 138:454-463(1990).
RN [3]
RP SEQUENCE FROM N.A.
RX SPECIES-MOUSE;
RX MEDLINE; 97128312.
RA Madial F., Hackshaw K.V., Chiu I.M.;
RT "Cloning and characterization of the mouse Fgf-1 gene.";
RL Gene 179:231-236(1996).
RN [4]
RP SEQUENCE FROM N.A.
RX SPECIES-MOUSE; STRAIN=BALE/C;
RX MEDLINE; 97094746.
RA Alam K.Y., Frotschalm A., Hackshaw K.V., Evans J.E., Rotter A.,
RA Chiu I.M.;
RT "Characterization of the 1B promoter of fibroblast growth factor 1
RT and its expression in the adult and developing mouse brain.";
RL J. Biol. Chem. 271:30263-30271(1996).
CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS
CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN
CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND
CC CONCENTRATION OF THESE 2 GROWTH FACTORS.
CC -!- SUBUNIT: MONOMER.
CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
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CC -----
CC EMBL; X14232; CAA32448.1; -
CC EMBL; M30641; AAA37618.1; -
CC EMBL; U38459; AAC52969.1; -
CC EMBL; U36457; AAC52969.1; JOINED.
CC EMBL; U36458; AAC52969.1; JOINED.
CC EMBL; U67610; AAC52907.1; -
CC PIR; S04147; S04147.
CC PIR; D37360; D37360.
CC HSSP; P05230; 2AXM.
CC MGD; MGI:95515; FGF1.
CC PFAM; PF00167; FGF; 1.
CC PRINTS; PR00262; IL1HBGF.

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DR PRINTS: PR00263; HBGFGF.  
DR PROSITE: PS00247; HBGFGF; 1.  
KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
FT PROPEP 1 15  
FT CHAIN 16 155 HEPARIN-BINDING GROWTH FACTOR 1.  
FT BINDING 24 28 HEPARIN (POTENTIAL).  
FT BINDING 113 116 HEPARIN (POTENTIAL).  
SQ SEQUENCE 155 AA; 17418 MW; 8880E4FF0FBA4161 CRC64;  
  
Query Match 69.28; Score 900; DB 1; Length 155;  
Best Local Similarity 92.28; Pred. No. 5.73e-201;  
Matches 130; Conservative 3; Mismatches 2; Indels 6; Gaps 1;  
  
Db 21 GNKKPKLLYCSNGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGVYIKSTG 80  
QY 41 ANYKKPKLLYCSNGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGVYIKSTG 100  
Db 81 AMDEGLLYSGTNPNECLFLERLEE-----NHYNTYTSKKHAENWFWGLKNGSKR 134  
101 AMDTGLLYSGTNPNECLFLERLEEAAATPAPNHYNTYTSKKHAENWFWGLKNGSKR 160  
135 GPRTHYQKAILFLPLPVSSD 155  
QY 161 GPRTHYQKAILFLPLPVSSD 181  
  
RESULT 4  
ID FGF1\_PIG STANDARD; PRT; 152 AA.  
AC P20002;  
DT 01-FEB-1991 (Rel. 17, Created)  
DT 01-FEB-1996 (Rel. 33, Last sequence update)  
DT 15-JUL-1999 (Rel. 38, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF) (ALPHA-ENDOTHELIAL CELL GROWTH FACTOR) (FRAGMENT).  
DE FGF1 OR FGF-1.  
GN Sus scrofa (Pig).  
OS "Amplification and sequencing of mRNA encoding acidic fibroblast growth factor (aFGF) from porcine heart."  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Cetartiodactyla; Suina; Suidae; Sus.  
RN [1]  
RP SEQUENCE FROM N.A.  
RC TISSUE=HEART;  
RX Schmidt M., Sharma H.S., Schott R.J., Schaper W.;  
RA Medline; 92062117.  
RT "Isolation of heparin-binding growth factors from bovine, porcine and canine hearts."  
RL Eur. J. Biochem. 181:67-73(1989).  
CC -1- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.  
CC -1- SUBUNIT: MONOMER.  
CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN, ALTHOUGH LESS STRONGLY THAN DOES BFGF.  
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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CC -----  
CC EMBL; X60317; CAA42869.1; .

DR PIR: S03954; S03954.  
DR HSP: P05230; 2AXM.  
DR PFAM: PF00167; FGF; 1.  
DR PROSITE: PS00247; HBGFGF; 1.  
KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
FT PROPEP 1 15  
FT CHAIN 16 >152 HEPARIN-BINDING GROWTH FACTOR 1.  
FT BINDING 22 >152 ENDOTHELIAL CELL GROWTH FACTOR ALPHA.  
FT BINDING 24 28 HEPARIN (POTENTIAL).  
FT BINDING 113 116 HEPARIN (POTENTIAL).  
FT CONFLICT 31 31 C -> S (IN REF. 2).  
FT CONFLICT 39 39 R -> Y (IN REF. 2).  
FT NON\_TER 152 152  
SQ SEQUENCE 152 AA; 17103 MW; AE853B0A92F9ABF4 CRC64;  
  
Query Match 68.48; Score 889; DB 1; Length 152;  
Best Local Similarity 91.58; Pred. No. 5.00e-198;  
Matches 129; Conservative 2; Mismatches 4; Indels 6; Gaps 1;  
  
Db 18 LPPGNKKPKLLYCSNGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGVYIKSTG 77  
QY 38 LDANYKKPKLLYCSNGHFLRLPDGTVGTRDRSDQHIQLQLSAESVGVYIKSTG 97  
Db 78 QYLANDTGLLYSGTNPNECLFLERLEE-----NHYNTYTSKKHAENWFWGLKNGS 131  
QY 98 QYLANDTGLLYSGTNPNECLFLERLEEAAATPAPNHYNTYTSKKHAENWFWGLKNGS 157  
132 CKRGPRTHYQKAILFLPLPV 152  
QY 158 CKRGPRTHYQKAILFLPLPV 178  
  
RESULT 5  
ID FGF1\_BOVIN STANDARD; PRT; 155 AA.  
AC P03968;  
DT 23-OCT-1986 (Rel. 02, Created)  
DT 01-MAR-1989 (Rel. 10, Last sequence update)  
DT 15-JUL-1999 (Rel. 38, Last annotation update)  
DE HEPARIN-BINDING GROWTH FACTOR 1 PRECURSOR (HBGF-1) (ACIDIC FIBROBLAST GROWTH FACTOR) (AFGF) (PROSTATROPIN) (ENDOTHELIAL CELL GROWTH FACTOR BETA AND ALPHA CHAINS) (ACIDIC EYE-DERIVED GROWTH FACTOR II) (EDGF II).  
GN Bos taurus (Bovine).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae; Bovidae; Bovinae; Bos.  
RN [1]  
RP SEQUENCE FROM N.A.  
RC TISSUE=RETINA;  
RX Halley C., Courtois Y., Laurent M.;  
RA Medline; 89083506.  
RT "Nucleotide sequence of bovine acidic fibroblast growth factor cDNA."  
RL Nucleic Acids Res. 16:10913-10913(1988).  
RN [2]  
RP SEQUENCE FROM N.A.  
RC TISSUE=RETINA;  
RX Alterio J., Halley C., Brou C., Soussi T., Courtois Y., Laurent M.;  
RT "Characterization of a bovine acidic FGF cDNA clone and its expression in brain and retina."  
RL FEBS Lett. 242:41-46(1988).  
RN [3]  
RP SEQUENCE OF 2-155.  
RX Burgess W.H., Mehlman T., Marshak D.R., Fraser B.A., Maciag T.;  
RA "Structural evidence that endothelial cell growth factor beta is the precursor of both endothelial cell growth factor alpha and acidic fibroblast growth factor."  
RL Proc. Natl. Acad. Sci. U.S.A. 83:7216-7220(1986).  
RN [4]  
RP SEQUENCE OF 2-155.  
RX Medline; 87026586.







```

CC -1- SUBUNIT: MONOMER.
CC -1- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES
CC AFGF.
CC
CC -1- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.
CC
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CC or send an email to license@isb-sib.ch).
CC -----
CC EMBL: MI3440; AAA30518.1; -.
CC DR PIR: A24663; GRBOB.
CC DR PIR: A24819; A24819.
CC DR PIR: A32878; A32878.
CC DR PDB: 1BAS; 31-OCT-93.
CC DR PFAM: PF00167; FGF; 1.
CC DR PRINTS: PR00262; IL1HBGF.
CC DR PRINTS: PR00263; HBGF.FGF.
CC DR PROSITE: PS00247; HBGF.FGF; 1.
CC KW Growth factor; Mitogen; Vascularization; Heparin-binding;
KW 3D-structure.
CC
CC PROPEP 1 9
CC FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.
CC FT CHAIN 25 155 KIDNEY-DERIVED GROWTH FACTOR.
CC FT SITE 46 48 CELL ATTACHMENT SITE (POTENTIAL).
CC FT SITE 88 90 CELL ATTACHMENT SITE (POTENTIAL).
CC FT BINDING 27 31 HEPARIN (POTENTIAL).
CC FT BINDING 116 119 HEPARIN (POTENTIAL).
CC FT STRAND 30 34 HEPARIN (POTENTIAL).
CC FT TURN 35 38
CC FT STRAND 39 43
CC FT TURN 45 45
CC FT STRAND 49 52
CC FT TURN 55 56
CC FT HELIX 58 60
CC FT STRAND 62 68
CC FT TURN 69 70
CC FT STRAND 71 76
CC FT TURN 77 80
CC FT STRAND 81 85
CC FT TURN 87 88
CC FT STRAND 91 94
CC FT HELIX 99 101
CC FT STRAND 103 107
CC FT TURN 109 110
CC FT STRAND 113 117
CC FT TURN 121 122
CC FT STRAND 124 124
CC FT STRAND 127 127
CC FT TURN 129 130
CC FT STRAND 133 133
CC FT HELIX 136 138
CC FT TURN 141 142
CC FT HELIX 144 146
CC FT STRAND 148 151
CC SQ SEQUENCE 155 AA; 17250 MW; BE6CE70FA6107129 CRC64;
CC
CC Query Match 35.2%; Score 458; DB 1; Length 155;
CC Best Local Similarity 49.0%; Pred. No. 5.62e-85;
CC Matches 76; Conservative 29; Mismatches 42; Indels 8; Gaps 3;
CC
Db 9 LPALPEDGGSGAFPPGHFKDPKRLCKNGGFFLRHPDGRVDGVREKSDPHIKLQLAAEE 68
QY : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
26 VSPAGARAQGTLLDANYKKPKLLYCSNGGHFLRLPDGTVGTRDRSDQHQLQLSAES 85
QY : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
Db 69 RGVYSTKGVCANYRLAMKEDGRLLASKCVTDCEFFFERLE-----S-NTNTYRSRKY- 121
QY | : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
86 VGEYIKSTETGYGLAMTDGLLYGSQTPNEEGLFLERLEEAATAPPNHYNTYISKHAE 145
QY | : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : : :
Db 122 -SWVAIKRTGQYKIGPKTCGOKATILFLDWSAKS 155

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QY 146 KNFVGLKNGSKRGPRTHYGQKAILFLPLVSS 180  
 :||:||||:| | ||:| |||||:| |

RESULT 9  
 ID FGF2\_SHEEP STANDARD; PRT; 155 AA.  
 AC P20003;  
 DT 01-FEB-1991 (Rel. 17, Created)  
 DT 01-FEB-1996 (Rel. 33, Last sequence update)  
 DT 01-FEB-1996 (Rel. 33, Last annotation update)  
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST  
 DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).  
 GN FGF2 OR FGF-2.  
 OS Ovis aries (Sheep).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;  
 OC Bovidae; Caprinae; Ovis.  
 RN [1]  
 SEQUENCE FROM N.A.  
 Suttou R., Ward W.G., Raphael K.A., Cam G.R.;  
 Submitted (SEP-1994) to the EMBL/GenBank/DBJ databases.  
 [2]  
 RP SEQUENCE OF 9-155.  
 RX MEDLINE; 88055577.  
 RA Simpson R.J., Moritz R.L., Lloyd C.J., Fabri L.J., Nice E.C.,  
 Rubira M.R., Burgess A.W.;  
 RT "Primary structure of ovine pituitary basic fibroblast growth  
 factor.";  
 RL FEBS Lett. 224:128-132(1987).  
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS  
 CC IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN  
 CC VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND  
 CC CONCENTRATION OF THESE 2 GROWTH FACTORS.  
 CC -!- SUBUNIT: MONOMER.  
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES  
 CC AFGF.

CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
 CC -----  
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 CC between the Swiss Institute of Bioinformatics and the EMBL outstation  
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 CC use by non-profit institutions as long as its content is in no way  
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 CC or send an email to [license@isb-sib.ch](mailto:license@isb-sib.ch)).  
 CC -----  
 CC EMBL; L36136; AAA31519.1;  
 CC PIR; S00185; S00185.  
 CC HSPP; P09038; 1BFF.  
 CC PFAM; PF00167; FGF; 1.  
 CC PRINTS; PR00262; ILLHBGF.  
 CC PRINTS; PR00263; HBGF.FGF.  
 CC DR PROSITE; PS00247; HBGF\_FGF; 1.  
 CC KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
 CC FT PROPEP 1 9  
 CC FT CHAIN 10 155 HEPARIN-BINDING GROWTH FACTOR 2.  
 CC FT SITE 45 48 CELL ATTACHMENT SITE (POTENTIAL).  
 CC FT SITE 87 90 CELL ATTACHMENT SITE (POTENTIAL).  
 CC FT BINDING 27 31 HEPARIN (POTENTIAL).  
 CC FT BINDING 116 119 HEPARIN (POTENTIAL).  
 CC SQ SEQUENCE 155 AA; 17280 MW; B5F2364BA610606D CRC64;

Query Match 34.8%; Score 453; DB 1; Length 155;  
 Best Local Similarity 52.9%; Pred. No. 1.05e-83;  
 Matches 74; Conservative 23; Mismatches 35; Indels 8; Gaps 3;  
 DB 24 GHFKPKRYLNGGFFRIHPDGRVDSKPHKQLQQAERGVSIVKGVCANRYL 83  
 QY 41 ANYKPKLLYCSNGHFIUPLDGTVDTRDSQHQQLQLSAESVGEVIKSTETQYL 100  
 DB 84 AMKEDGRLLASKCVTDECFERLE-----S--NNYNTYRSKYS--SWYVALKRTGYKL 135  
 QY 101 AMDTDGLLYGSQTPNECLFLERLEAATPAPNHYNTYISKHAENKWFVGLKNGSKCR 160

DB 136 GPKTGPCQKAILFLPMSAKS 155  
 QY 161 GPRTHYGQKAILFLPLVSS 180  
 :||:||||:| | ||:| |||||:| |  
 RESULT 10  
 ID FGF2\_HUMAN STANDARD; PRT; 155 AA.  
 AC P09038;  
 DT 01-NOV-1988 (Rel. 09, Created)  
 DT 01-NOV-1988 (Rel. 09, Last sequence update)  
 DT 01-NOV-1997 (Rel. 35, Last annotation update)  
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST  
 DE GROWTH FACTOR) (BFGF) (PROSTATROPIN).  
 GN FGF2 OR FGF.  
 OS Homo sapiens (Human).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.  
 RN [1]  
 SEQUENCE FROM N.A.  
 RX MEDLINE; 87053817.  
 RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Friedman J.,  
 Gospodarowicz D., Fiddes J.C.;  
 RT "Human basic fibroblast growth factor: nucleotide sequence and  
 RT genomic organization.";  
 RL EMBO J. 5:2523-2528(1986).  
 RN [2]  
 SEQUENCE FROM N.A.  
 RX MEDLINE; 87217066.  
 RA Abraham J.A., Whang J.L., Tumolo A., Mergia A., Fiddes J.C.;  
 RT "Human basic fibroblast growth factor: nucleotide sequence, genomic  
 RT organization, and expression in mammalian cells.";  
 RL Cold Spring Harb. Symp. Quant. Biol. 51:657-668(1986).  
 RN [3]  
 SEQUENCE FROM N.A.  
 RX MEDLINE; 87213238.  
 RA Sommer A., Brewer M.T., Moscatelli D., Presta M.,  
 Rifkin D.B.;  
 RT "A form of human basic fibroblast growth factor with an extended  
 RT amino terminus.";  
 RL Biochem. Biophys. Res. Commun. 144:543-550(1987).  
 RN [4]  
 SEQUENCE FROM N.A.  
 RX MEDLINE; 87162468.  
 RA Kurokawa T., Sasada R., Iwane M., Igarashi K.;  
 RT "Cloning and expression of cDNA encoding human basic fibroblast  
 RT growth factor.";  
 RL FEBS Lett. 213:189-194(1987).  
 RN [5]  
 SEQUENCE FROM N.A.  
 RX MEDLINE; 89184522.  
 RA Prats H., Kaghad M., Prats A.C., Klagsbrun M., Lelias J.M.,  
 Liauzun P., Chalou P., Tauber J.P., Anallric F., Smith J.A.,  
 Caput D.;  
 RT "High molecular mass forms of basic fibroblast growth factor are  
 RT initiated by alternative CUG codons.";  
 RL Proc. Natl. Acad. Sci. U.S.A. 86:1836-1840(1989).  
 RN [6]  
 SEQUENCE OF 10-35.  
 RX MEDLINE; 86275260.  
 RA Gautschi P., Frater-Schroeder M., Boehlen P.;  
 RT "Partial molecular characterization of endothelial cell mitogens from  
 RT human brain: acidic and basic fibroblast growth factors.";  
 RL FEBS Lett. 204:203-207(1986).  
 RN [7]  
 SEQUENCE OF 10-39.  
 RX MEDLINE; 86186784.  
 RA Gimenez-Gallego G., Conn G., Hatcher V.B., Thomas K.A.;  
 RT "Human brain-derived acidic and basic fibroblast growth factors:  
 RT amino terminal sequences and specific mitogenic activities.";  
 RL Biochem. Biophys. Res. Commun. 135:541-548(1986).  
 RN [8]  
 SEQUENCE OF 2-22.



RESULT 11

ID	FGF2_RAT	STANDARD;	PRT;	154 AA.
AC	PI3109;			
DT	01-JAN-1990 (Rel. 13, Created)			
DT	01-JAN-1990 (Rel. 13, Last sequence update)			
DT	15-JUL-1998 (Rel. 36, Last annotation update)			
DE	HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF) (PROSTATROPIN).			
GN	FGF2 OR FGF-2.			
OS	Rattus norvegicus (Rat).			
OC	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;			
NC	Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.			
[1]	SEQUENCE FROM N.A.			
RC	STRAIN-SPRAGUE-DAWLEY; TISSUE-OVARY;			
RX	MEDLINE; 89061721..			
RA	Shimasaki S., Emoto N., Koba A., Mercado M., Shibata F., Cooksey K., Baird A., Ling N.;			
"	Complementary DNA cloning and sequencing of rat ovarian basic fibroblast growth factor and tissue distribution study of its mRNA.";			
Biochem. Biophys. Res. Commun. 157:256-263(1988).				
[2]	SEQUENCE FROM N.A.			
RC	TISSUE-BRAIN;			
RX	MEDLINE; 88262516.			
RA	Kurokawa T., Seno M., Igarashi K.;			
"	Nucleotide sequence of rat basic fibroblast growth factor cDNA.";			
Nucleic Acids Res. 16:5201-5201(1988).				
[3]	SEQUENCE OF 1-28 FROM N.A.			
RC	STRAIN-SPRAGUE-DAWLEY; TISSUE-TESTIS;			
RX	MEDLINE; 97200905.			
RA	Pasumarthi K.B.S., Jin Y., Cattini P.A.;			
"	Cloning of the rat fibroblast growth factor-2 promoter region and its response to mitogenic stimuli in glioma C6 cells.";			
J. Neurochem. 68:898-908(1997).				
[4]	SEQUENCE OF 35-154 FROM N.A.			
RC	STRAIN-SPRAGUE-DAWLEY; TISSUE-BRAIN;			
RX	MEDLINE; 92329546.			
RA	El-Husseini A.E.D., Paterson J.A., Myal Y., Shiu R.P.C.;			
"	PCR detection of the rat brain basic fibroblast growth factor (bFGF) RNA containing a unique 3' untranslated region.";			
Biochim. Biophys. Acta 1131:314-316(1992).				
-1-	FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.			
-1-	SUBUNIT: MONOMER.			
-1-	TISSUE SPECIFICITY: FOUND IN ALL THE TISSUES EXAMINED.			
-1-	CELLULAR LOCATION: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES AFGE.			
-1-	SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.			
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EMBL; M22427; AAA41210.1; -				
EMBL; X07285; CAAC30265.1; -				
EMBL; U78079; AAC53225.1; -				
EMBL; X61697; CAA43863.1; -				
PIR; S00876; S00876				
PIR; A31674; A31674				
HSP; P09036; IBFF.				
PFAM; PF00167; FGF. 1.				
PRINTS; PR00262; ILIHGFI.				

FT BINDING 26 30 HEPARIN (POTENTIAL).  
 FT BINDING 115 118 HEPARIN (POTENTIAL).  
 SQ SEQUENCE 154 AA; 17153 MW; 689F677416274388 CRC64;

Query Match 34.2%; Score 445; DB 1; Length 154;  
 Best Local Similarity 52.1%; Pred. No. 1.14e-81;  
 Matches 73; Conservative 24; Mismatches 35; Indels 8; Gaps 3;

Db 23 GHFKDPKRLKCKNGGFFLRHPDGRVGVREKSDPHVQLQLOAERGVSIVKVCANRYL 82  
 QY 41 ANYKPKLLYCSNGGHFLRLPDGVDRSDQHIOQLSAESVGEVYIKSTETGYL 100  
 Db 83 AWKEDGRLLAKCVTECEFFERLE-----S--NNYNTYRSKYS--SWYALKRTGYKL 134  
 QY 101 AMDTDGLLYGSGTPNEECLEFLERLEAATPAPNHYNTYISKHAEKNWFVGLKNGSCKR 160

Db 135 GSKTGPQKAILFLPMSAKS 154  
 QY 161 GPRTHYGOKAILFLPVS 180

RESULT 13  
 ID FGF2\_MONDO STANDARD; PRT; 156 AA.  
 AC P48798;  
 DT 01-FEB-1996 (Rel. 33, Created)  
 DT 01-FEB-1996 (Rel. 33, Last sequence update)  
 DT 01-NOV-1997 (Rel. 35, Last annotation update)  
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF) (PROSTATROPIN).  
 GN FGF2.  
 OS Monodelphis domestica (Short-tailed grey opossum).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
 OC Mammalia; Metatheria; Didelphimorphia; Didelphidae; Monodelphis.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RC TISSUE-EYE;  
 RX MEDLINE; 94296558.  
 RA Kusewitt D.F., Sabourin C.L.K., Sherburn T.E., Ley R.D.;  
 RT "Characterization of cDNA encoding basic fibroblast growth factor of the marsupial Monodelphis domestica";  
 RL DNA Cell Biol. 13:549-554(1994).  
 CC -!- FUNCTION: THE HEPARIN-BINDING GROWTH FACTORS ARE ANGIOGENIC AGENTS IN VIVO AND ARE POTENT MITOGENS FOR A VARIETY OF CELL TYPES IN VITRO. THERE ARE DIFFERENCES IN THE TISSUE DISTRIBUTION AND CONCENTRATION OF THESE 2 GROWTH FACTORS.  
 CC -!- SUBUNIT: MONOMER.  
 CC -!- MISCELLANEOUS: THIS PROTEIN BINDS HEPARIN MORE STRONGLY THAN DOES AFGF.  
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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 CC -----  
 DR EMBL; Z15154; CRA78854.1; ALT\_INIT.  
 DR HSP; P09038; IBFF.  
 DR PFAM; PF00167; FGF; 1.  
 DR PRINTS; PR00263; ILIHGFG.  
 DR PRINTS; PR00263; HBGFFGF.  
 DR PROSITE; PS00247; HBGF\_FGF; 1.  
 DR PROSITE; PS00247; HBGF\_FGF; 1.  
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
 FT PROPEP 1 9  
 FT CHAIN 10 156  
 FT BINDING 28 32 HEPARIN-BINDING GROWTH FACTOR 2.  
 FT BINDING 117 120 HEPARIN (POTENTIAL).  
 SQ SEQUENCE 156 AA; 17303 MW; 7E659FCC49BF1209 CRC64;

Query Match 33.8%; Score 439; DB 1; Length 156;  
 Best Local Similarity 51.0%; Pred. No. 3.78e-80;

Matches 74; Conservative 25; Mismatches 38; Indels 8; Gaps 3;

Db 20 GAFFPGHFKDPKRLKCKNGGFFLRHPDGRVGVREKSDPHVQLQLOAERGVSIVKVC 79  
 QY 36 GTLLDANYKKPKLLYCSNGGHFLRLPDGVDRSDQHIOQLSAESVGEVYIKSTE 95  
 Db 80 ANYLAMEKDEGRLLAKVYVECEFFERLE-----S--NNYNTYRSKYS--NWYALKRT 131  
 QY 96 TGOYLMADTDGLLYGSGTPNEECLEFLERLEAATPAPNHYNTYISKHAEKNWFVGLKKN 155

Db 132 GOYKLGSKTGPQKAILFLPMSAKS 156  
 QY 156 GSKRGPRTHYGOKAILFLPVS 180

RESULT 14  
 ID FGF2\_XENLA STANDARD; PRT; 155 AA.  
 AC P12226;  
 DT 01-OCT-1989 (Rel. 12, Created)  
 DT 01-JAN-1990 (Rel. 13, Last sequence update)  
 DT 01-NOV-1997 (Rel. 35, Last annotation update)  
 DE HEPARIN-BINDING GROWTH FACTOR 2 PRECURSOR (HBGF-2) (BASIC FIBROBLAST GROWTH FACTOR) (BFGF).  
 GN FGF2 OR FGF-2.  
 OS Xenopus laevis (African clawed frog).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
 OC Amphibia; Batrachia; Anura; Mesobatrachia; Pipidae;  
 OC Xenopodinae; Xenopus.  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE; 89058621.  
 RA Kimelman D., Abraham J., Haaparanta T., Palisi T., Kirschner M.;  
 RT "The presence of fibroblast growth factor in the frog egg: its role as a natural mesoderm inducer";  
 RL Science 242:1053-1056(1988).  
 RN [2]  
 RP SEQUENCE OF 95-155 FROM N.A.  
 RX MEDLINE; 88052890.  
 RA Kimelman D., Kirschner M.;  
 RT "Synergistic induction of mesoderm by FGF and TGF-beta and the identification of an mRNA coding for FGF in the early Xenopus embryo";  
 RL Cell 51:869-877(1987).  
 CC -!- SIMILARITY: BELONGS TO THE HEPARIN-BINDING GROWTH FACTORS FAMILY.  
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 CC -----  
 DR EMBL; M18067; AAA49726.1;  
 DR PIR; A29618; A29618.  
 DR PIR; A40117; A40117.  
 DR HSP; P09038; IBFF.  
 DR PFAM; PF00167; FGF; 1.  
 DR PRINTS; PR00262; ILIHGFG.  
 DR PRINTS; PR00263; HBGFFGF.  
 DR PROSITE; PS00247; HBGF\_FGF; 1.  
 KW Growth factor; Mitogen; Vascularization; Heparin-binding.  
 FT PROPEP 1 9  
 FT CHAIN 10 155  
 FT BINDING 27 31 HEPARIN-BINDING GROWTH FACTOR 2.  
 FT BINDING 116 119 HEPARIN (POTENTIAL).  
 FT CONFLICT 111 111 MISSING (IN REF. 2).  
 SQ SEQUENCE 155 AA; 17241 MW; 036735C8063142FD CRC64;

Query Match 32.8%; Score 427; DB 1; Length 155;  
 Best Local Similarity 51.4%; Pred. No. 4.12e-77;  
 Matches 72; Conservative 24; Mismatches 36; Indels 8; Gaps 3;



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MPsrch_pp  protein - protein database search, using Smith-Waterman algorithm
on: Tue Aug 29 15:46:07 2000; MasPar time 16.81 Seconds
746.641 Million cell updates/sec
Regular output not generated.

Title: >US-09-121-017B-5
Description: (1-181) from US09121017B.pep
Perfect Score: 1300
Sequence: 1 MSRGARGVQGTGLQALVFLGV, .....PRTHYGQKAILFLPLPVSSD 181

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**Statistics:** Mean 43.003; Variance 69.719; scale 0.617

## SUMMARIES

Result No.	Query		DB	ID	Description	Pred. No.
	Score	Match				
1	451	34.7	196	4	P78443	1.110e-79
2	448	34.5	130	6	21 KD BASIC FIBROBLAST	5.93e-79
3	319	24.5	101	6	BASIC FIBROBLAST GROWTH	3.82e-48
4	283	21.8	146	13	BASIC FGF (FRAGMENT)	8.07e-40
5	266	20.5	59	4	FIBROBLAST GROWTH FACT	6.01e-36
6	267	20.3	60	4	ACIDIC FIBROBLAST GROW	3.57e-36
7	264	20.3	70	11	ACIDIC FIBROBLAST GROW	1.70e-35
8	258	19.8	212	13	FIBROBLAST GROWTH FACT	3.85e-34
9	250	19.2	115	11	FIBROBLAST GROWTH FACT	2.41e-32
10	242	18.6	194	6	BASIC FIBROBLAST GROWTH	1.47e-30
11	240	18.5	252	11	KERATINOCYTE GROWTH FA	4.09e-30
12	227	17.5	243	13	FGF-4B	3.03e-27
13	223	17.2	192	4	FIBROBLAST GROWTH FACT	2.28e-26
14	223	17.2	245	13	FIBROBLAST GROWTH FACT	2.28e-26
15	222	17.1	127	4	FIBROBLAST GROWTH FACT	3.77e-26
16	208	16.0	206	13	FIBROBLAST GROWTH FACT	4.09e-23
17	206	15.8	196	13	PUTATIVE FIBROBLAST GR	1.10e-22
18	186	14.3	114	4	BASIC FIBROBLAST GROWTH	1.90e-18
19	186	14.3	114	4	BASIC FIBROBLAST GROWTH	1.90e-18
20	178	13.7	74	6	KERATINOCYTE GROWTH FA	8.59e-17

Db 110 RGVSVIKGVCANRYLAMKEDGRLLASCVTDECFFERLE-----S-NNYNTYRSRYT- 162  
 QY 86 VGEVYIKSTGTGYLAMDGTGLYSGTPTNEECFLERLEEAATPAPNHYNTYISKHAE 145  
 Db 163 -SWYVALKRTGYKLGSKTGPQKAILFLPMSAKS 196  
 QY 146 KKNFVGLKNGSKRGPRTHYGQKAILFLPLPVSS 180

RESULT 2  
 ID O77767 PRELIMINARY; PRT; 130 AA.  
 AC O77767;

DT 01-NOV-1998 (T-EMBLrel. 08, Created)  
 DT 01-NOV-1998 (T-EMBLrel. 08, Last sequence update)  
 DT 01-NOV-1999 (T-EMBLrel. 12, Last annotation update)  
 DE BASIC FIBROBLAST GROWTH FACTOR (FRAGMENT).  
 GN BFGF.

Canis familiaris (Dog).  
 Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
 Eutheria; Carnivora; Fissipedia; Canidae; Canis.  
 [1]

RP SEQUENCE FROM N.A.  
 RC TISSUE-ADRENAL GLAND;  
 RA TROCHTA O.A., JACOBS R.M., LAMARRE J.;  
 RT "The role of bFGF in canine Hemangiosarcoma."  
 RL Submitted (APR-1998) to the EMBL/GenBank/DBJ databases.  
 DR EMBL: AF060562; AAC35912.1;  
 DR HSSP: P09038; IBFF.

DR PROSITE: PS00247; HBGF\_FGF; 1.  
 DR PFAM: PF00167; FGF; 1.  
 FT NON\_TER 1  
 FT NON\_TER 130

QY SEQUENCE 130 AA; 14902 MW; DB6A90A4 CRC32;  
 Query Match 34.5%; Score 448; DB 6; Length 130;  
 Best Local Similarity 52.9%; Pred. No. 5.93e-79;  
 Matches 73; Conservative 22; Mismatches 35; Indels 8; Gaps 3;

Db 1 FKDPKLYCKNGGFFLRHDPGRVDGVRKSDPHVKLOLAERGVSVIKGVCANRYLAM 60  
 QY 43 YKPKLLYCSNGGHFLRILPDGTVDTRDRSDQHIQLQLSAESVGEVYIKSTGTGYLAM 102

Db 61 KEDGRLLASCVTDECFFERLE-----S-NNYNTYRSRYT--SWYVALKRTGYKLG 112  
 QY 103 DTGGLYSGTPTNEECFLERLEEAATPAPNHYNTYISKHAEKNWFVGLKNGSKRG 162

113 KTGPGQKAILFLPMSAKS 130  
 163 RTHYGQKAILFLPLPVSS 180

RESULT 3  
 ID P79706 PRELIMINARY; PRT; 101 AA.  
 AC P79706;

DT 01-MAY-1997 (T-EMBLrel. 03, Created)  
 DT 01-MAY-1997 (T-EMBLrel. 03, Last sequence update)  
 DT 01-NOV-1999 (T-EMBLrel. 12, Last annotation update)  
 DE BASIC FGF (FRAGMENT).

OS Cynops pyrrhogaster (Japanese common newt).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Amphibia;  
 OC Batrachia; Caudata; Salamandroidea; Salamandridae; Cynops.  
 RN [1]

RP SEQUENCE FROM N.A.  
 RC TISSUE-EMBRYO;  
 RA SUZUKI A.S., TABATA T., SAKAGUCHI K., TAKABATAKE T., TAKEISHIMA K.,  
 RA KANEDA T.;

RT "Serial expression of the genes in a mesodermizing ectoderms of  
 early Cynops gastrula."  
 RL Submitted (NOV-1996) to the EMBL/GenBank/DBJ databases.

DR EMBL: D89443; BAAL3998.1;  
 DR HSSP: P09038; 2BFH.  
 DR PROSITE: PS00247; HBGF\_FGF; 1.

DR PFAM: PF00167; FGF; 1.  
 FT NON\_TER 1  
 FT NON\_TER 101  
 SQ SEQUENCE 101 AA; 11907 MW; 1CD93BB0 CRC32;

Query Match 24.5%; Score 319; DB 13; Length 101;  
 Best Local Similarity 50.5%; Pred. No. 3.82e-48;  
 Matches 55; Conservative 19; Mismatches 27; Indels 8; Gaps 3;

Db 1 PKRLYCKNGGFFLRINSKGVGAREKSDSYIKLQLOAEERGVSVIKGVCANRYLAMKDD 60  
 QY 46 PKLLYCSNGGHFLRILPDGTVDTRDRSDQHIQLQLSAESVGEVYIKSTGTGYLAMDT 105

Db 61 GRMLALKWLTDECFFERLE-----S-NNYNTYRSRYT--WYVALKR 101  
 QY 106 GLDYGSTPTNEECFLERLEEAATPAPNHYNTYISKHAEKNWFVGLKK 154

RESULT 4  
 ID Q07659 PRELIMINARY; PRT; 146 AA.  
 AC Q07659;

DT 01-NOV-1996 (T-EMBLrel. 01, Created)  
 DT 01-NOV-1996 (T-EMBLrel. 01, Last sequence update)  
 DT 01-NOV-1999 (T-EMBLrel. 12, Last annotation update)  
 DE FIBROBLAST GROWTH FACTOR.  
 GN BFGF.

OS Gallus gallus (Chicken).

OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;  
 OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.  
 RN [1]

RP SEQUENCE FROM N.A.  
 RX MEDLINE: 93246053.

RA BORJA A.Z., ZELLER R., MEIJERS C.;

RT "Expression of alternatively spliced bFGF first coding exons and  
 antisense mRNAs during chicken embryogenesis."  
 RL Dev. Biol. 157:110-118(1993).

RN [2]  
 RP SEQUENCE OF 52-85 FROM N.A.  
 RX MEDLINE: 90382254.

RA MITRANI E., GRUENBAUM Y., SHOHAT H., ZIV T.;

RT "Fibroblast growth factor during mesoderm induction in the early chick  
 embryo."  
 RL Development 109:387-393(1990).

DR EMBL: M95706; AAA48616.1;  
 DR EMBL: X56804; CAA40139.1;  
 DR HSSP: P09038; 2BFH.

DR PROSITE: PS00247; HBGF\_FGF; 1.  
 DR PFAM: PF00167; FGF; 1.

DR PRINTS: PR00262; ILJHBGF.  
 SQ SEQUENCE 146 AA; 16182 MW; 44C5274B CRC32;

Query Match 21.8%; Score 283; DB 13; Length 146;  
 Best Local Similarity 45.5%; Pred. No. 8.07e-40;  
 Matches 50; Conservative 21; Mismatches 31; Indels 8; Gaps 3;

Db 45 ERVSAMVKLOLAERGVSVIKGVSNRFLAMKEDGRLLALKCATCECFERLE----- 99  
 QY 71 DRSDQHIQLQLSAESVGEVYIKSTGTGYLAMDTGGLYSGTPTNEECFLERLEEAATP 130

Db 100 S-NNYNTYRSRYT--WYVALKRTGYKPGPKTGPQKAILFLPMSAKS 146  
 QY 131 APNHYNTYISKHAEKNWFVGLKNGSKRGPRTHYGQKAILFLPLPVSS 180

RESULT 5  
 ID Q16089 PRELIMINARY; PRT; 59 AA.  
 AC Q16089;

DT 01-NOV-1996 (T-EMBLrel. 01, Created)  
 DT 01-NOV-1996 (T-EMBLrel. 01, Last sequence update)  
 DT 01-NOV-1999 (T-EMBLrel. 12, Last annotation update)  
 DE ACIDIC FIBROBLAST GROWTH FACTOR (FRAGMENT).

OS Homo sapiens (Human).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;





RESULT 11  
ID O89096 PRELIMINARY; PRT; 252 AA.  
AC O89096;

Query Match	17.5%;	Score 227;	DB 13;	Length 243;
Best Local Similarity	30.8%;	Pred. No. 3.03e-27;		
Matches	40;	Mismatches 30;	Indels - 3;	Gaps 3;
Ddb	77	LF-SQEEFLQHHDDGTIDCTKDNSDYTLFNLPLVGLRVVAIQGVAGLIVANNAEYL	135	
QY	49	LYCSNGGHFLRLPDGTVDRSDRQHQIQLSAESGYEVIKSTETGOYLANDMTDGLL	108	
Ddb	136	YSSDVFTEPCFKFSVFENYYVI-YSSPLY-RQOESGRAWFLGNKEGOIMKNRVVKTK	193	
QY	109	YGSQTPNEECUFLFKLEBAATPAPHNYNTYSKKHAEKNWFVLUKNKGSCRCRTHHYQG	168	

Db 194 PSSHFVPKPI 203  
: |::|:  
QY 169 KALFLPLPV 178

RESULT 13  
ID O95830 PRELIMINARY; PRT; 192 AA.

AC O95830;  
DT 01-MAY-1999 (TREMREL. 10, Created)  
DT 01-MAY-1999 (TREMREL. 10, Last sequence update)  
DT 01-NOV-1999 (TREMREL. 12, Last annotation update)  
DE FIBROBLAST GROWTH FACTOR 13 ISOFORM 1B.  
GN FGF13.

OS Homo sapiens (Human).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
OC Eutheria; Primates; Catarrhini; Hominidae; Homo.  
RN [1]  
RP SEQUENCE FROM N.A.

TISSUE=BRAIN;  
MEDLINE; 99168751.

RA GECZ J., BAKER E., DONNELLY A., MING J.E., MCDONALD-MCGINN D.M.,  
RA SPINNER N.B., ZACKAI E.H., SUTHERLAND G.R., MULLEY J.C.;  
RT "Fibroblast growth factor homologous factor 2 (FHF2): gene structure,  
RT expression and mapping to the Borjeson-forssman-Lehmann syndrome  
RT region in Xq26 delineated by a duplication breakpoint in a BFLS-like  
RT patient."  
RL Hum. Genet. 104:56-63(1999).  
DR EMBL; AF100144; RAD16401.1;  
DR HSSP; P03988; IAFD.  
DR PROSITE; PS00247; HBGF\_FGF; 1.  
SQ SEQUENCE 192 AA; 21580 MW; 9AD05A36 CRC32;

Query Match 17.2%; Score 223; DB 4; Length 192;  
Best Local Similarity 31.5%; Pred. No. 2.28e-26;  
Matches 41; Conservative 27; Mismatches 59; Indels 3; Gaps 3;

Db 20 LYSROGYH-LQLOADGTIDGTDEKEDSYTLFNLIPVGLRVVAIQGVQTKLYLAMNSEGYL 78  
: |::|:  
QY 49 LYCSNGGHFLRILPDGTVDGTRSDQHQLQLSAESVGEVIKSTETGQYLANDTDGLL 108

Db 79 YTSFTPECKFKESVFENY-VYSSMIY-ROQSGRWYGLNKEGEIMKGNHVKNK 136  
: |::|:  
QY 109 YGSQTPNEECFLERLEEAATPAPNHNTYISKKAENWVGLKNGSKRGPRTHYGO 168

Db 137 PAAHFLPKPL 146  
: |::|:  
QY 169 KALFLPLPV 178

RESULT 14  
ID O9W6A2 PRELIMINARY; PRT; 245 AA.

AC O9W6A2;  
DT 01-NOV-1999 (TREMREL. 12, Created)  
DT 01-NOV-1999 (TREMREL. 12, Last sequence update)  
DT 01-NOV-1999 (TREMREL. 12, Last annotation update)  
DE FIBROBLAST GROWTH FACTOR 13 ISOFORM 1S.  
GN FGF13.

OS Gallus gallus (Chicken).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Archosauria; Aves;  
OC Neognathae; Galliformes; Phasianidae; Phasianinae; Gallus.  
RN [1]  
RP SEQUENCE FROM N.A.

TISSUE=BRAIN;  
MEDLINE; 99065510.

RA MUNOZ-SANJUAN I., SIMANDL B.K., FALLON J.F., NATHANS J.;  
RT "Expression of chicken fibroblast growth factor homologous factor  
RT (FHF)-1 and of differentially spliced isoforms of FHF-2 during  
RT development and involvement of FHF-2 in chicken limb development."  
RL Development 126:409-421(1999).  
DR EMBL; AF108755; RAD21576.1;  
DR PROSITE; PS00247; HBGF\_FGF; 1.  
SQ SEQUENCE 245 AA; 27605 MW; A8C17203 CRC32;

Query Match 17.2%; Score 223; DB 13; Length 245;  
Best Local Similarity 30.8%; Pred. No. 2.28e-26;  
Matches 40; Conservative 28; Mismatches 59; Indels 3; Gaps 3;

Db 73 LYSROGYH-LQLOADGTIDGTKEEDSSYTLFNLIPVGLRVVAIQGVQTKLYLAMNSEGYL 131  
: |::|:  
QY 49 LYCSNGGHFLRILPDGTVDGTRSDQHQLQLSAESVGEVIKSTETGQYLANDTDGLL 108

Db 132 YTSFTPECKFKESVFENY-VYSSMIY-ROQSGRWYGLNKEGEIMKGNHVKNK 189  
: |::|:  
QY 109 YGSQTPNEECFLERLEEAATPAPNHNTYISKKAENWVGLKNGSKRGPRTHYGO 168

Db 190 PAAHFLPKPL 199  
: |::|:  
QY 169 KALFLPLPV 178

RESULT 15  
ID Q99517 PRELIMINARY; PRT; 127 AA.

AC Q99517;  
DT 01-MAY-1997 (TREMREL. 03, Created)  
DT 01-MAY-1997 (TREMREL. 03, Last sequence update)  
DT 01-NOV-1999 (TREMREL. 12, Last annotation update)  
DE FIBROBLAST GROWTH FACTOR 12 (FRAGMENT).  
GN FGF12.  
OS Homo sapiens (Human).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia;  
OC Eutheria; Primates; Catarrhini; Hominidae; Homo.  
RN [1]  
RP SEQUENCE FROM N.A.  
RA COULIER F., PONTAROTTI P., ROUBIN R., HARTUNG H., GOLDFARB M.,  
RA BIRNBAUM D.;  
RL J. Mol. Evol. 0:0-0(0).  
DR EMBL; Z70276; CAA94240.1;  
DR HSSP; P03968; IAFD.  
DR PROSITE; PS00247; HBGF\_FGF; 1.  
DR PFAM; PF00167; FGF; 1.  
FT NON\_TER 1 127  
FT NON\_TER 127 127  
SQ SEQUENCE 127 AA; 14478 MW; 10E2842D CRC32;

Query Match 17.1%; Score 222; DB 4; Length 127;  
Best Local Similarity 31.0%; Pred. No. 3.77e-26;  
Matches 40; Conservative 29; Mismatches 57; Indels 3; Gaps 3;

Db 2 LF-SOOGYELQHPDGTIDGTKEEDSSYTLFNLIPVGLRVVAIQGVQTKLYLAMNSEGYL 60  
: |::|:  
QY 49 LYCSNGGHFLRILPDGTVDGTRSDQHQLQLSAESVGEVIKSTETGQYLANDTDGLL 108

Db 61 YSSDVTPECKFKESVFENYV-VYSSMIY-ROQSGRWYGLNKEGEIMKGNHVKNK 118  
: |::|:  
QY 109 YGSQTPNEECFLERLEEAATPAPNHNTYISKKAENWVGLKNGSKRGPRTHYGO 168

Db 119 PSSHFVPKPI 127  
: |::|:  
QY 169 KALFLPLPV 177

Search completed: Tue Aug 29 15:47:19 2000  
Job time : 72 secs.

